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ABSTRACT

This document is the newest revision of the third manual documenting the National Agricultural Library database. Since it began in 1970, the AGRICOLA database has continued to grow and to change steadily; new subfiles have been added, database record formats have been expanded, and subject category code schemes have been modified several times. The number of users of the file has grown steadily as well, and this revision of the manual attempts to meet the needs of both sophisticated searchers and the growing number of end users of information. The basic arrangement remains the same, although several changes in content and emphasis have been made. Section I now contains a general discussion of characteristics of agricultural literature that many affect online retrieval. Section II updates the technical aspects of AGRICOLA, documenting policies and various elements of the database records, e.g., subject codes and language abbreviations. Sections III and IV, which document the database as it is loaded on the DIALOG and BRS (Bibliographic Retrieval Services) systems, concentrate on fields in the database record and assume that the reader has other sources covering the mechanics of searching the two systems. Section V covers database selection and cross-database searching. Summaries of the category codes, DIALOG/BRS basic functions, and DIALOG/BRS retrieval codes are included. (BBM)

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AGRICOLA USER'S GUIDE

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AGRICOLA User's Guide

Charles L. Gilreath

1984

PREFACE

The National Agricultural Library is pleased to present this newest revision of the AGRICOLA User's Guide. As a dynamic organization within the world agricultural community, our databases must change to meet current and future informational requirements of that community. During the 11 years we have had online search services, we have upgraded and improved the AGRICOLA family of databases to meet the changing requirements of the United States Department of Agriculture, associated agencies, and cooperators by adding numerous specialized bibliographic subfiles to AGRICOLA. We have also changed formats of the entries and section headings of publications derived from the database to reflect user needs.

The AGRICOLA family of databases continues to be distributed through commercial vendors whose software programs aid in servicing the needs of the dynamics of the information industry and changes must be included in our user guides. The current guide is being issued as a loose-leaf publication and changes will be issued as replacement pages or supplements to the present version.

The changing structure of world agriculture is placing greater emphasis on food supplies, on nutrition and health, on improved sociological aspects of agriculture, on the educational programs of the Federal Extension Service, on environmental concerns, on energy, and the conservation of agricultural resources. Accordingly, the Library has added subfiles for Extension publications to be used in adult education programs, a file of 4-H program material, a parasitology file, an Extension repository of USDA sponsored theses publications, and has greatly expanded its collection of Environmental Impact Statements.

Future additions to the AGRICOLA family of databases will include a bibliography on tropical soils, an extensive file of arid lands publications, and increased coverage of alternative crops as renewable resources. At the same time, we are moving to minimize separate subfiles by encouraging adoption of national standards which will make it possible to incorporate added subjects into the primary files of AGRICOLA.

Since 1976, the National Agricultural Library has provided a series of beginning and advanced classes for prospective and present users of the AGRICOLA family of databases. Such courses are tailored to meet the needs of user groups and may range from 1 to 5 days in length. Information on these classes may be obtained by writing to:

USDA, National Agricultural Library
Education & Information Staff, Room 203
Beltsville, MD 20705

Comments or suggestions for changes to this publication may also be sent to the above address.

JOSEPH H. HOWARD
Director
National Agricultural Library

FOREWORD

This revised edition of the AGRICOLA User's Guide is the third manual documenting the NAL database. Since it began in 1970, the AGRICOLA database has continued to grow and to change steadily; new subfiles have been added, database record formats have been expanded, and subject category code schemes have been modified several times. During this period, the number of users of the file has grown steadily as well. Many users are information professionals, sophisticated in their use of computerized information sources. In recent years, however, a growing number of users of the file are not literature searching specialists, but rather scientists, administrators or other "end-users" of information who want to search bibliographic files on their own. Meeting the needs of these very different groups has been the particular challenge of this latest revision.

While the basic arrangement of the manual remains the same, several changes in content and emphasis have been made. Section I now contains a general discussion of characteristics of agricultural literature which may affect online literature retrieval. Section II updates the technical aspects of AGRICOLA, documenting policies and various elements of the database records such as subject codes, language abbreviations, and the like. Sections III and IV, which document the database as it is loaded on the DIALOG and the BRS systems, have been substantially reduced in size from previous editions. They now concentrate on fields in the database record and assume that the reader has other sources covering the mechanics of searching these retrieval systems. Section V covers other aspects of searching agricultural literature such as database selection and cross-database searching.

I wish to thank the staff of the National Agricultural Library, who took time from their busy schedules on several occasions to answer my questions and to read through drafts of the guide. Without their cooperation the job simply could not have been done.

College Station, Texas
May, 1984

Charles L. Gilreath

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SECTION I
INTRODUCTION

A. HISTORY OF THE SYSTEM

AGRICOLA, an acronym for Agricultural Online Access, is the machine-readable database produced by the National Agricultural Library to support the bibliographic research of agricultural scientists. Citations to worldwide published literature in virtually every field of agriculture will be found in the system. Representative of the specific subjects which can be searched are the following:

Agricultural engineering	Horticulture
Agricultural marketing	Land management
Animal breeding	Nutrition
Energy in agriculture	Pesticides
Entomology	Plant genetics
Environmental pollution	Remote sensing in agriculture
Farm management	Rural sociology
Fertilizers	Soil sciences
Foods and feeds	Veterinary medicine
Forestry	Water resources

The database started in January 1970 as the Cataloging and Indexing system of NAL (CAIN), developed from an earlier computerized system in use at the Pesticides Information Center. At the outset it was designed to assist NAL staff to handle the enormous workload they faced in the production of catalog cards and in preparation of copy for the Bibliography of Agriculture. The program proved highly successful for that purpose, and it was adopted by other units within the Department--notably the Food and Nutrition Information Center (FNIC) and the American Agricultural Economics Documentation Center (AAEDC) to provide assistance in the creation of bibliographic records for their own publications. Initially only NAL cataloging and indexing records were made publicly available in the database called CAIN. Over the years, however, the records created by FNIC and AAEDC along with citations derived from several other sources have been added to the online database, so that AGRICOLA can, with some justification, be considered a family of databases rather than a single monolithic file. In recognition of this view of the database, the name was changed from CAIN to AGRICOLA in July, 1976.

Bibliographic records prepared by the staff at NAL and the other information centers are processed by the Information Systems Division of NAL and recorded on magnetic tape. These machine-

readable records are then the bases for several publications and other information services. Internally, NAL has used the tapes to produce its own catalog cards, early editions of the FNIC catalog, and several other information products. Copies of the tapes are also produced and sold to users outside the National Agricultural Library through the National Technical Information Service (NTIS). The Bibliography of Agriculture and the current editions of the FNIC catalog, for instance, are published by commercial firms from the tapes. Several other organizations acquire copies of the monthly tapes for direct searching by computer either in batch mode or in an online interactive mode. With such systems there are numerous information services that are possible, ranging from selective dissemination of information services (SDI) and retrospective literature searching on demand to retrieval of cataloging copy and citation verification for interlibrary loan.

This manual will concentrate on the online mode of accessing the file, basic strategies employed in constructing search strategies for online literature retrieval, and the fundamentals of establishing computer communications. Section II provides the user with information about AGRICOLA unit records plus an explanation of the policies and practices followed by each of the units preparing records for the database. Sections III and IV provide detailed information about access to the AGRICOLA database in the online environment of two commercial systems. Section III describes how to access AGRICOLA with the system of DIALOG Information Retrieval Service and section IV covers access using the system of Bibliographic Retrieval Service (BRS). These two sections are fairly detailed and are designed for the user who is in need of a comprehensive treatment on how to search AGRICOLA utilizing a particular online system. For at-the-terminal reference, several charts summarizing information in Sections III and IV have been placed in appendixes at the end of the manual. Section V provides a discussion of several agricultural literature searching techniques. It is designed to provide the searcher some practical guidance in selecting appropriate databases and in formulating efficient strategies on topics related to agricultural research.

B. AGRICULTURAL LITERATURE--SOME OBSERVATIONS

While the mastery of library research techniques is a challenging task in any field, the job requires an extra measure of diligence in applied fields such as agriculture. Not only must agriculturalists be aware of publications in their areas of professional specialization, but they must also keep abreast of

publications emanating from a number of related areas of pure research. To put it another way, agriculturalists may write the literature of agriculture, but in order to accomplish that task they must also read the literature of the sciences and the social sciences. The breadth of literature encompassed by agriculture thrusts upon the online search strategist the task of knowing terminology and the organization of information in most of the major areas of the life sciences and in a number of research areas of the physical and the social sciences as well.

The varied nature and content of agricultural literature can have a devastating effect on the quality of output for the search service user who fails to structure his search strategies properly. Although it is impossible to cover all problem areas, the following observations may help the novice searcher avoid some of the thornier ones.

1. Coverage. Whether a specific database will contain the material needed is a function of several factors, not the least of which is the typical "half life" of information in a particular field. That is, researchers in a field such as high energy physics are more likely to get a large majority of the literature they need from a computer search of files such as INSPEC and SPIN simply because the useful life of information in that field is short (often well under 10 years). An insect taxonomist, on the other hand, may be able merely to scratch the surface of the literature by searching files such as BIOSIS (Biological Abstracts), CAB (Commonwealth Agricultural Bureaux), or AGRICOLA because literature in that field tends to remain pertinent for decades--far exceeding the years covered by machine-readable databases. AGRICOLA's coverage begins with 1970, which is a fairly common starting point for machine-readable files. There seems to be little likelihood that any substantial extension of coverage into earlier years will be made by AGRICOLA or any other database. In some fields of agriculture topics seem to have a cyclic history; for several years they may be much discussed and then cease to be of interest, only to be "rediscovered" as a result of environmental, scientific, political, or economic changes. Interest in certain marginal-area crops such as jojoba and guayule is an example of this phenomenon. There was a good deal of work done on them in the 1930's and 1940's, but little was done with them for the next two decades. Interest in them has been revived in the past few years--spurred on by the energy crisis and the resulting emphasis on renewable energy sources. Where the online systems cannot provide coverage of a sizable portion of relevant publications, it

may still be worthwhile to conduct a literature search with the expectation of finding among the current papers footnote citations to significant older work.

A final aspect of database coverage is that of the criteria and procedures employed by database producers in choosing items to include in their files. At one extreme are databases such as the Institute for Scientific Information's SCISEARCH that includes indexing of all editorial matter in each journal selected for the file. Most other files are less inclusive in their coverage, having a few core publications for cover-to-cover treatment and only pertinent articles from a larger number of publications outside the core. For the searcher this means that it will sometimes be difficult to predict whether a particular article will, in fact, be in a file such as AGRICOLA or CAB. This problem can be particularly worrisome with agricultural databases which cover selectively an enormous number of publications.

2. Organism names. Agriculturalists look at the same organisms from a wide variety of perspectives, which can create some interesting challenges for online retrieval strategies. Agricultural economists, for example, are generally interested in agricultural products as commodities, not as taxonomic specimens. Consequently, the language they use in referring to them tends to be broad and general--"corn" rather than "Zea mays" or "beef cattle" rather than "Hereford-Angus crossbred steers." The animal geneticist or the plant pathologist, however, focuses on organisms in such a way that precise nomenclature, down to the genus and species level and below, is important. Given the great differences in names which are likely to occur in an agricultural database, the search service user will need to consider in the planning process whether common names will be sufficient or whether the strategy should also include genus or genus-species nomenclature. Clearly it would be unnecessary and expensive to include Latin names of grain crops in a search for information dealing with grain futures pricing policies. But it would be equally foolish not to include them in a search on the genetics of particular range grasses or forage crops.

3. Contextual problems. Related to the problems surrounding organism or crop names is the more general issue of how professionals communicate with each other within their own discipline. The jargon and technical terminology current in a field can certainly be a problem for search strategists,

but usually asking a well informed user or scanning a few relevant papers in the field can provide many of these terms. More difficult to determine, however, are the things which tend to be left out, the communication shortcuts that are common to professionals writing for their peers. Consider, for example, the following article title: "Hampshire X Large White X Landrace Crossing Effects," which illustrates several features of the communication between specialists. Nowhere does it contain any words denoting that this is a paper dealing with swine; rather the breed names are considered adequate for the audience of veterinarians to whom it is addressed. The cautionary message to be derived here is that the search strategist who uses only general class names--cattle, swine, field crops, and similar names--may miss vast numbers of highly relevant papers which discuss a topic in relation to particular species or varieties. In addition, the nature of the crossbreeding is indicated by means of a convention clearly understood among breeding specialists, that is, through use of the "X." While this convention allows clear communication in the context of a printed citation, it can be a stumbling block in the computer search unless the searcher realizes that most computer systems will treat each "X" as a separate word and adjust the strategy accordingly.

4. Spelling and usage variations. Careful attention to spelling is a cardinal rule in computer searching. Although there are a few computer programs that provide a "closest match" feature, the misspelled word is effectively lost in the vast majority of online retrieval systems. It is not always the misspelled word, however, that can be most troublesome in databases such as AGRICOLA, where so much of the information originates outside the United States. British spelling and usage as well as regional terminology should always be considered for inclusion in keyword lists. Common variations in spelling such as the substitution of "s" for "z" in words such as "organization" or the use of "our" instead of "or" in words such as "color" or "flavor" are easy to remember. Less easy to remember are variations such as "haematology/hematology" or "oedema/edema" or "tyres/tires." Further complicating the process are the differences in usage between American and non-American authors. For instance, Americans may write about truck transport costs in the potato chip and cookie industries, while their British colleagues would write about lorry transport costs in the potato crisp and biscuit industries. Fortunately, usage problems are not as frequent as are those arising from spelling differences.

5. Chemical nomenclature. The systematic naming of chemical compounds is a complicated task. Not only can the names of organic compounds be difficult to construct (let alone type properly), but they often have a dismaying number of synonyms as well. Take as an example the growth regulator indole-3-acetic acid. It is also known as heteroauxin, rhizopin, beta-indoleacetic acid, IAA, 3-IAA, and beta-IAA, as well as being the form of the compound commonly referred to simply as indoleacetic acid. Herbicides, pesticides, and other heavily used agricultural chemicals also frequently become known by proprietary names such as "Roundup" or "Modown." Any searches involving chemical names, therefore, will be likely to require a little research by the search analyst so that common differences in the names can be included in the strategy.

C. FUNDAMENTALS OF ONLINE RETRIEVAL

This section outlines the principles of using online computer programs to retrieve citations from a bibliographic database. A discussion of computer retrieval operation is followed by discussions of Boolean logic and search strategy formulation.

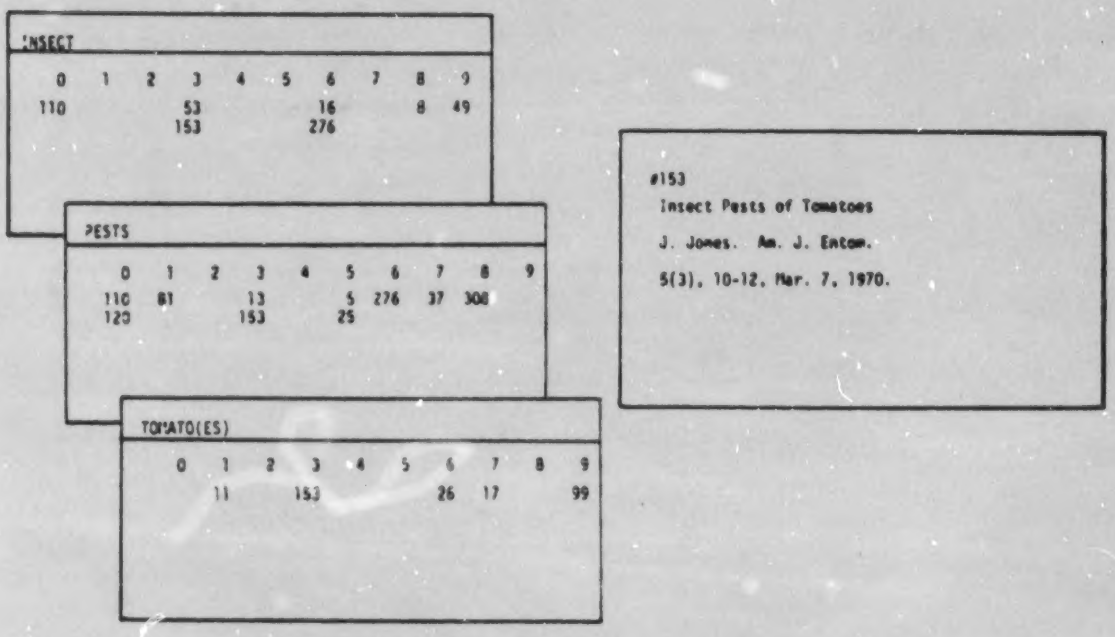
Computer Retrieval Operation

Traditional bibliographic retrieval tools--in the form of printed indexing and abstracting services--are usually hierarchical in nature. For example, a paper which describes a mathematical model for predicting fresh tomato prices might be indexed first under a fairly broad heading such as "commodity prices." That subject heading may then be further subdivided by subheadings such as "vegetables" and "mathematical models." In order to retrieve a citation from such a bibliographic tool, the user must be able both to determine the proper form of accepted indexing terms and to understand the nature of the indexing hierarchy.

A different type of bibliographic tool from the hierarchical index is the coordinate index. In such an index, users do not work within the structure of a predetermined hierarchy of terms, but rather they make the connections between desired intellectual categories themselves by looking among a relatively large group of keywords for those citations which contain two or more of the desired terms. It is on the principle of this type of index that computer retrieval of bibliographic citations is based in many of the most heavily used online systems.

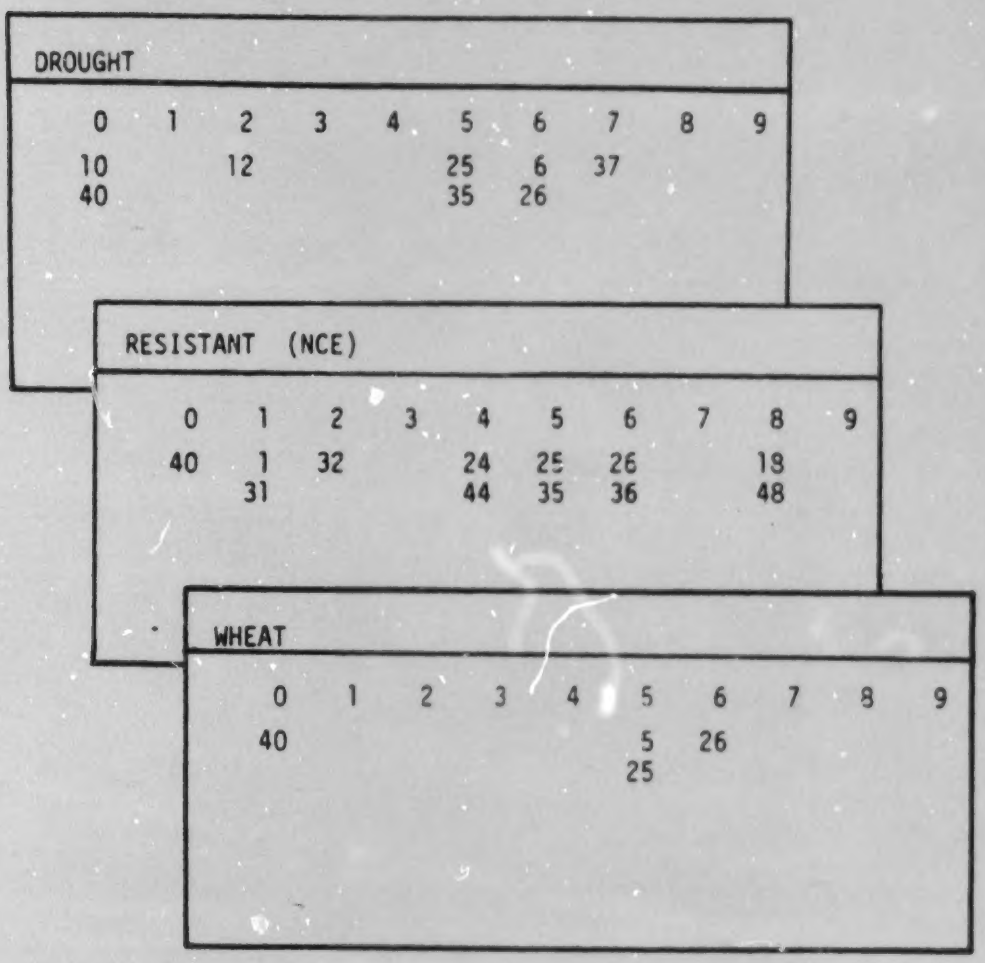
Before going further, let us look a bit more carefully at an example of how a manual coordinate index works. Each item to be indexed is given a unique identifying number which is posted to a series of index cards, one for each significant term associated with that item. Commonly, uniterms--single words drawn from titles, abstracts, or other parts of the citation--are the terms used in such an index, although the indexer need not be restricted to such terms.

To illustrate, assume the item to be indexed is an article by John Jones entitled "Insect Pests of Tomatoes." First, the item would be given an identification number, 153, let us say. That number would be added to appropriate columns of index cards according to the last digit in the identification number shown in figure I-1. Posting in columns in this manner is simply to aid the eye in scanning numbers.



BEST COPY AVAILABLE

To retrieve information from such an index, the user simply pulls appropriate index term cards and then looks for the occurrence of the same item numbers in different cards. For example, a user interested in finding information on drought-resistant strains of wheat might pull the three cards shown in figure I-2.



BEST COPY AVAILABLE

From these cards the user would see that items 25, 26, and 40 contain all three of the desired terms, and are therefore likely to be on the topic. In order to find these references, the user must finally go to another file containing the full bibliographic citations arranged by their identification numbers. The items cited in our example might have led the user to articles entitled "Drought Resistant Wheat in Western Kansas," "Drought- and Insect-Resistance in Grain Crops (Wheat, Barley)," and "Insect Resistance of Untreated Wheat Stands under Drought Conditions."

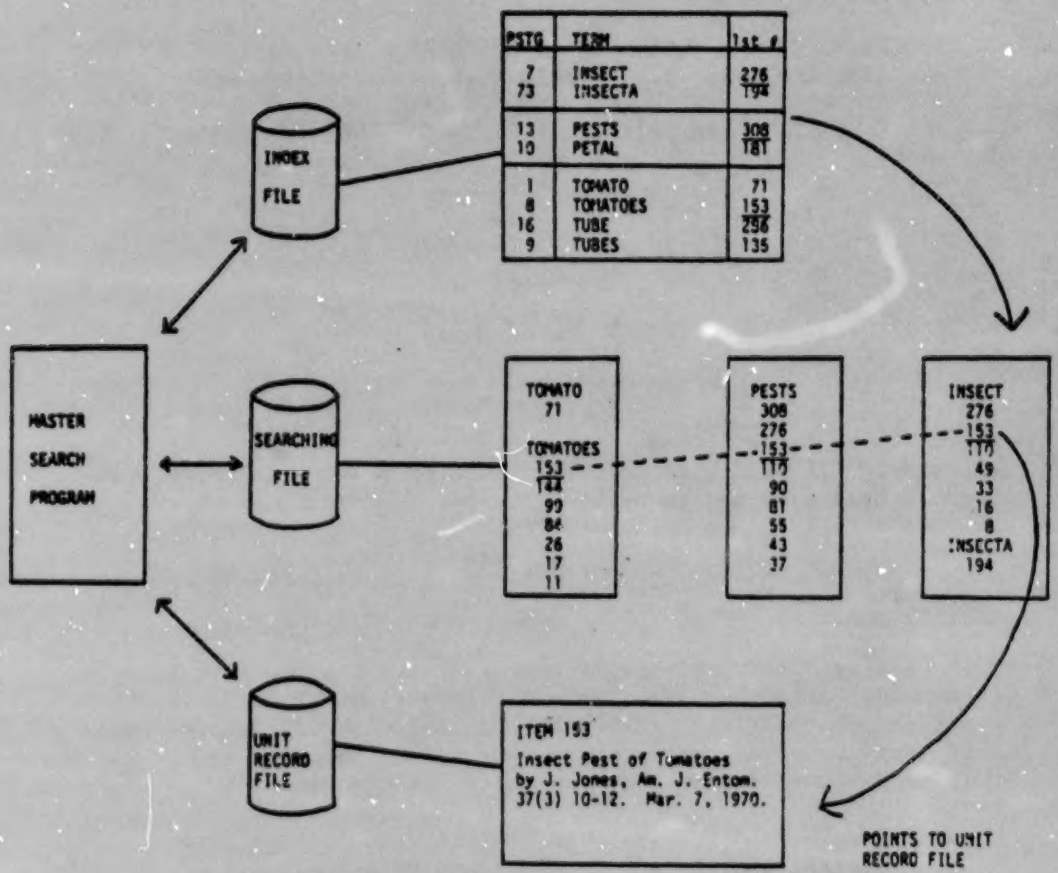
A manual system such as this one works reasonably well provided the database is not too large or the number of terms to be searched is fairly small. But an index covering over 100,000 articles or a search strategy requiring that 15 or 20 terms be coordinated is too unwieldy for manual operation. The computer, however, is ideally suited to the task of number comparison such as is required in a coordinate indexing system.

The 1960's saw the advent of the computer into the publishing process. Many publishers began to switch much of their operations from traditional text preparation techniques to computer typesetting. A significant byproduct of that new technology is a machine-readable file of information that can be manipulated by other data retrieval programs. In the late 1960's several systems were developed to provide online searching of bibliographic index files. Particularly noteworthy among these early efforts were two Government programs. System Development Corporation's (SDC's) work with the MEDLARS system of the National Library of Medicine provided sophisticated searching of Index Medicus. Lockheed Missiles and Spacecraft Corporation, at about the same time, was developing for the Atomic Energy Commission and the National Aeronautics and Space Administration another program, called RECON (REmote CONsole), for searching indexes of technical literature. Further development on these prototype systems resulted in the ORBIT (SDC) and the DIALOG (Lockheed) services that are in use throughout the world today.

The last decade, of course, has seen the development of many other large scale systems for querying textual files. Each of the systems offers some unique features but almost all perform the same basic functions; that is, they allow users to choose search terms--words, names, phrases, codes, and the like--and to combine them with logical connectors in order to find references in the file that contain those terms. The searching system for an online computer system is, in fact, merely a much more sophisticated version of the manual system described earlier. A typical online search file structure looks like the one illustrated in figure I-3.

The index file is an alphabetical list of searchable terms with the number of postings for each term and a pointer to the first item in the searching file for that term. The searching file is very similar to the card file of the manual system; it contains sequential lists of numbers for each term in the index file. It is the numbers in this file that are compared when the computer looks for coordinations of terms. Finally, the unit record file contains the actual bibliographic citations in machine-readable form. This file normally comes into use when the terminal operator requests to see the results of the search.

Let us again take the example of a user looking for articles on drought-resistant wheat to illustrate the operation of the online system. The terminal operator instructs the program to find all coordinations of the three terms DROUGHT, RESISTANT, and WHEAT.


PSTG
TERM
1st #
7
INSECT
276
73
INSECTA
194
13
PESTS
308
10
PETAL
181
1
TOMATO
71
8
TOMATOES
153
16
TUBE
256
9
TUBES
135
INDEX
FILE
MASTER
SEARCH
PROGRAM
SEARCHING
FILE
TOMATO
71
TOMATOES
153
144
99
84
26
17
11
PESTS
308
276
153
119
90
81
55
43
37
INSECT
276
153
119
49
33
16
8
INSECTA
194
UNIT
RECORD
FILE
ITEM 153
Insect Pest of Tomatoes
by J. Jones, Am. J. Entom.
37(3) 10-12. Mar. 7, 1970.
POINTS TO UNIT
RECORD FILE

First, the computer goes to the index file and finds the following information:

POSTINGS	TERM	1st #
8	DROUGHT	40
7	RESISTANT	48
5	RESISTANCE	44
4	WHEAT	40

It then goes to the searching file, takes the appropriate item numbers from the file and compares them, as shown below:

DROUGHT	RESISTANT	RESISTANCE	WHEAT	COORDINATIONS
40	48	44	40	40
37	40	32	26	26
35	36	26	25	25
26	35	25	5	
25	24	18		
12	13			
10	1			
6				

Having found three items, the computer reports this fact to the operator. If the operator then wishes to view these three items, the computer goes to its unit record file, finds items 40, 26, and 25, and displays them at the terminal.

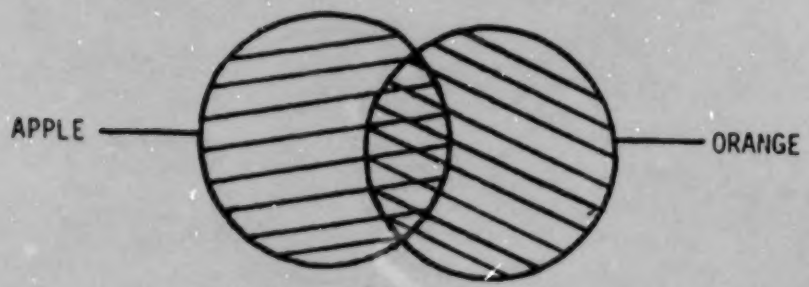
Boolean Logic

Having seen very generally what the computer does in response to commands from the user, we now turn our attention to the means by which the searcher instructs the computer to combine terms. This task is accomplished through the use of Boolean logic, named for the mathematician who developed it, George Boole.

Individual search terms can be combined through use of the Boolean logical operators OR, AND, and NOT (sometimes called AND NOT). Use of these operators allows the searcher either to increase the recall of the final output by broadening search parameters or to increase the precision of the output by (1) cutting out unwanted elements or (2) requiring that additional search parameters be satisfied. The function of each Boolean operator will be discussed in the paragraphs that follow.

Logical OR. The Boolean operator OR serves primarily an additive or broadening function. Its use allows the searcher to combine several terms into a single set or search statement.

The Venn diagram graphically illustrates the function of OR with the terms APPLE and ORANGE.



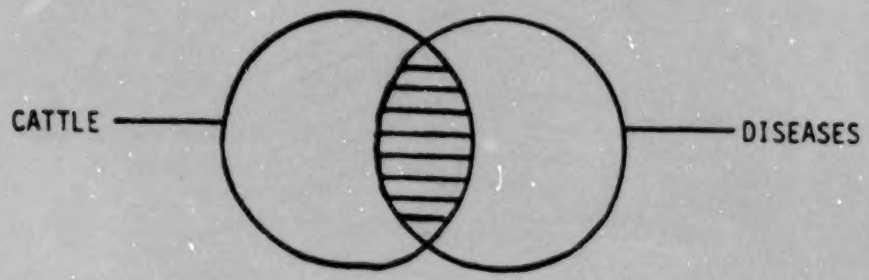
APPLE OR ORANGE

In normal English discourse a person who uses the conjunction "or" expects a response based on an exclusive understanding of the word; that is, when people say, "Give me an apple or an orange," they expect one or the other but not both. Such is not the case with Boolean logic--or the computers which use it. When they use the logical OR, searchers are, in effect, telling the computer to create a set consisting of all items in the database containing either the term APPLE or the term ORANGE or both of them together.

Notice in the diagram that there is a small area where the circles overlap. This area represents those terms which contain both of the search terms. Potentially the user could retrieve the same item twice, using OR logic--once for each time one of the search terms appears. The computer, however, adjusts for this contingency and counts OR-ed terms in such a way that duplicate retrieval is eliminated. For example, assume that the computer found 50 citations containing the terms APPLE and 35 citations containing the term ORANGE. Also assume that there are 10 citations in the database which contain both terms. When the individual sets were combined with OR, the result would then be a set containing 75 citations: 40 containing only APPLE, 25

containing only ORANGE, and 10 containing both terms.

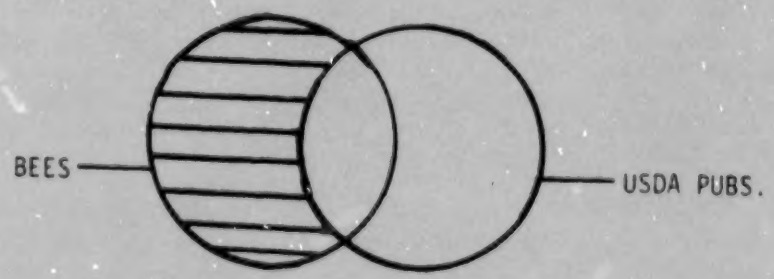
Logical AND. The Boolean AND serves as a tool for narrowing the output of a search. The searcher uses this operator to look for co-occurrences of various search terms. The Venn diagram for the search statement CATTLE AND DISEASES is illustrated below:



CATTLE AND DISEASES

The only items retrieved in such a search are the ones containing both of the desired terms. No word order is specified when the Boolean AND is used; so both an item entitled "Annual Review of Cattle Diseases" and one entitled "Diseases Common to Horses and Cattle" could be retrieved in this example.

Logical NOT (AND NOT). The NOT operator is used to exclude from a set some unwanted element. For instance, a user who desired information on bees but who was not interested in USDA publications might wish to use NOT logic as illustrated in the diagram.



BEES NOT USDA PUBS.

The resulting set is a list of items containing the term BEES, excluding only those items published by the U.S. Department of Agriculture. This method is a safe and proper use of the NOT operator. It may also be usefully employed to exclude other categories of information, such as the work of authors already familiar to the patron or articles in a specific journal. Thus, one might ask for all references containing the word "alpaca" except for any works by J.L. Montemayor.

The NOT operator can be quite useful as well in isolating particular groups of references during an online search session. In the course of broadening a search, for example, the user may utilize this operator to eliminate from the newly broadened output those references which have already been retrieved, thereby allowing one to view only the net increase of the broadened search. Great caution, however, must be exercised in the use of NOT in order to avoid eliminating inadvertently any desired citations. Problems of this type arise primarily in trying to use NOT to eliminate unwanted subject terms. For example, in a search on varieties of corn, the user may want to eliminate hybrid varieties, but there is no way to do this without also eliminating all items on ordinary varieties which may mention hybrid varieties in the same citation. Specifically, a title such as "Free Amino Acids in the Leaves of Inbred and Hybrid Varieties of Corn" would be eliminated by use of NOT in this way.

The illustrations up to this point have been quite simple, utilizing only two combinations with single Boolean operators. By using a mixture of logical connectors in conjunction with several search terms, a powerful research tool can be developed. The following example will, perhaps, illustrate how the Boolean operators can work together to retrieve useful information. Let us assume that a searcher is looking for articles on the commodity futures market for wheat and corn. The first step is to select separately the terms WHEAT and CORN and then combine them with the logical operator OR in order to create as large a set as possible on the specific commodities of interest. Up to this point his computer printout might look like this:

SET#	CONTENT	# OF ITEMS
1	WHEAT	11812
2	CORN	7142
3	1 OR 2	18727

Note that the 18727 items in set 3 are 227 fewer than the arithmetic sum of the items in sets 1 and 2. This indicates that there are 227 items which contain both the terms WHEAT and CORN, and the computer has counted these items only once in a combined

set.

The user then selects the search terms FUTURES and, using the AND operator, combines it with the composite set number 3, thus:

4	FUTURES	143
5	3 AND 4	8

Finally, the searcher chooses to exclude all monographic publications from the output by using the NOT operator. The search strategy would end up looking like this:

6	MONOGRAPHS	72931
7	5 NOT 6	7

To summarize, the user has had the computer look for all items in which the term FUTURES co-occurs with either CORN or WHEAT and then has excluded any monographic publications from the output.

Search Strategy Formulation

Finally, we are ready to put things together into a general principle of search strategy formulation. The assumption underlying all computer retrieval of this type is that if a bibliographic citation contains a desired combination of specified keywords, then that citation may be relevant to the search topic. Of course, this assumption does not always hold true, as is illustrated by the retrieval of an article entitled, "Italian Economic Boat Leaking" retrieved from a search on the economic factors associated with the boating industry. It does, however, hold true often enough to make computer retrieval a valuable research tool.

While "false positives" or "false hits" such as "Italian Economic Boat Leaking" cannot be avoided totally, their number can be minimized through careful planning of the search strategy. If the essence of search strategy formulation can be summarized in one sentence, it is this: Efficient retrieval from a computerized bibliographic database requires (1) a clear idea of the topic to be searched, clearly stated; (2) the development of an adequate list of keywords divided logically into concept groups; and (3) an ability to adjust the initial strategy on the basis of information gained from preliminary review of search output.

Statement of the Search Topic

End users of the computer-produced bibliography are the best source of the initial statement of the search topic. It is, after all, their needs that are to be met by the computer search, and it is against their conception of the topic that the results will be judged. If--as is commonly the case--the person doing the computer search is someone other than the end user, the statement of the topic may need to be negotiated. For instance, undergraduate students may say that they want all citations on tissue culture, not realizing that the computer is likely to visit upon them many thousands of citations on that topic--many of them in foreign languages. A trained search analyst can, however, help a patron refine the initial request, revising it according to the patron's needs and the capabilities of the computer system to be used.

A well negotiated statement of search topic should tell the searcher the following information:

1. The specific subject to be searched.
2. Priorities of various elements in the search topic, for example, the user is specifically looking for desiccation as a technique in harvesting sunflower seeds, but anything on harvesting of sunflower seeds is also of interest.
3. Purpose for the search, that is, is the search for an undergraduate's term paper or for a doctoral candidate's dissertation?
4. Any special requirements such as format of printed citations or date limitations, and the like.

Keyword List and Concept Grouping

Once searchers have a clear idea of the search topic, they must devise a list of appropriate keywords for the computer to search. Keywords can be single-word terms from titles and other subject-related fields, authors' names, corporate names, subject codes, and numerous other elements from the unit record categories. Depending on the database, keywords may also be multiword terms drawn from controlled vocabulary lists.

A well expressed topic statement can serve as a guide to selecting appropriate keywords for the search strategy. The patron requesting the search is another valuable resource for additional terms, synonyms, and alternative forms of search words. Since the AGRICOLA database relies so heavily upon free text--uncontrolled vocabulary--searching, the analyst will be wise

to consider including several alternative forms of key terms in order to allow for the many different ways in which ideas can be stated in the titles of works. For instance, the analyst who simply uses the keywords BEEF and CATTLE in a strategy, will fail to retrieve many relevant citations containing words such as COW, COWS, CALF, CALVES, BULL, and so forth. Asking end users for the titles of some particularly relevant items with which they are familiar and/or looking through a few issues of printed indexes in the subject areas of the proposed search will be valuable sources of terms likely to be helpful in the strategy. Controlled vocabulary lists, such as the Agricultural/Biological Vocabulary or the Library of Congress Subject Headings can also be most useful.

There is, of course, a point of diminishing returns in compiling such a list, especially in cases where the patron has imposed other constraints on the search, such as size of output or amount to be spent on the search. Complete coverage of a topic may, however, require a fairly long list of terms.

An unstructured list of possible search terms is, however, only half the search analyst's job. The other half of search strategy formulation is concept grouping. This aspect of search strategy has been alluded to earlier when Boolean operators were being discussed, but a few points need to be looked at in more detail. The computer is merely searching for strings of characters. It has no ability to judge either the context in which terms appear or the interrelationship which may exist among various groups of terms. The search analyst must therefore try to compensate for the computer's weakness by specifying which combinations of search parameters are acceptable. The most efficient method of accomplishing this task is to divide the list of key terms within a concept group with the logical OR, and then combining concept groups with either the AND or the NOT operators in order to narrow retrieval to the desired group of references.

Let us take a fairly simple example to illustrate concept grouping. A patron is looking for information regarding the effect seed size and weight have on the growth and yield of corn plants. A working list of keywords includes the following:

CORN	MASS
YIELD	LENGTH
GROWTH	WIDTH
SEED	PRODUCTION
SEEDS	MAYS
DIMENSION	MAIZE
DIMENSIONS	ZEA

SIZE	WEIGHT
YIELDS	GERMINATION

Individual combinations of all these various terms would consume inordinate amounts of both computer connect time and search preparation time. The same result, however, can be accomplished quickly and efficiently by grouping terms by concept, joining terms within the same concept group with the Boolean OR, and then looking for intersections of the various concept groups with the logical AND.

This problem should be broken into four concepts. First, there is the crop being studied--corn. The aspect of the plant which is the focus of the study--that is, seed size and weight--will constitute a second and third concept, one for seed terms and one for terms related to size and weight. Finally, a fourth category of terms will need to be used to zero in on references dealing with growth and yield factors. Our initial list, grouped for searching, would look like this:

I--CORN OR ZEA AND MAYS OR MAIZE
II--SEED OR SEEDS
III--SIZE OR WEIGHT OR DIMENSION OR DIMENSIONS
OR LENGTH OR WIDTH OR MASS
IV--YIELD OR GROWTH OR PRODUCTION OR GERMINATION

The searcher would then instruct the computer to look for the intersections of the concept groups by combining them with the Boolean AND, thus I AND II AND III AND IV. To be retrieved, an item must then contain at least four keywords, one from each of the four major concept groups. Thus, this logic could retrieve titles such as "Seed Mass: Its Effects on Germination of Corn" and "Increased Seed Dimensions Produce Greater Yield in Corn."

Adjusting Initial Strategy

Regardless of how thoroughly the analyst has prepared the initial search strategy, there will be times when the system will turn up valuable search terms that have been overlooked. Conversely, the search may also prove that terms originally thought to be good are retrieving far too many "false positives" or bad hits, and therefore need to be excluded from or further qualified in the strategy. The searcher must be aware of these possibilities so that he can adjust the content of appropriate concept groups in order to increase the quality of the final bibliography.

Users of batch mode searching systems should review their initial results critically and make necessary adjustments so that succeeding iterations of the search will be better. Online system users have a decided advantage over batch system users in that they can adjust their strategies immediately and assess the quality of the additional items retrieved in a matter of seconds.

D. ONLINE COMMUNICATION

Access to AGRICOLA can be gained through regular teletype terminals; high-speed, dedicated line computer terminals; or teletype-compatible, acoustically coupled terminals. While each of the major online vendors can support access to its databases via teletype, users should be aware that using teletype terminals will very likely result in higher search costs because they are slower in outputting results (100 wpm) and because teletype line charges are generally higher than the communications charges for using other data communications networks.

Dedicated line terminals offer the greatest speed (around 480 characters per second or more). Because of the extra quality of the communications line and the fact that it involves dedication of costly hardware, the cost of this sort of telecommunications link is usually cost effective only for extremely high volume users of online systems.

The most common means of accessing online databases is through acoustically coupled, teletype-compatible terminals. Such devices are supported by online vendors through regular telephone connections. These terminals operate at a variety of speeds ranging from 10 characters per second (cps) (approximately 100 wpm) up to 120 characters per second (approximately 1200 wpm). Today the most commonly used terminals function at either 30 or 120 characters per second. Generally 30 character-per-second terminals are less expensive to buy than the faster terminals, but their reduced capital cost is somewhat offset by their higher operating cost. As with teletype machines, 30 cps terminals simply cannot output information as fast as the 120 cps terminal, not an insignificant factor when one contemplates having typed out bibliographies of many dozen citations.

Thre are two main types of teletype compatible terminals: hard copy printers and cathode ray tube (CRT) terminals, sometimes called video display terminals (VDT's) or video display units (VDU's). Hard copy printers are simply typewriter-like devices which print the two halves of the online dialogue on a piece of paper. Many models are portable, an advantage for users who expect to be carrying terminals around for demonstrations.

Cathode ray tube terminals differ from hard copy terminals in that they display input and output on a television-like screen. Such terminals are today not much more expensive than the terminals using paper, and certainly have some advantages if the user anticipates having to demonstrate the retrieval system to groups. Two decided disadvantages, however, are the lack of portability and the lack of a permanent record of the search. Hard copy printers can be added to the CRT terminals for making a permanent record of results, but these are another substantial addition to the cost of equipment and further complicate the portability of the device.

The advent of microcomputers in the past decade has greatly increased the number of options open to users of online search systems. By the addition of a modem or acoustic coupler and perhaps some simple software, many microcomputers can be used effectively to query the online systems of bibliographic search services as well the files of other "information utilities." Microcomputers offer the user additional searching options as well since they can store information offline to be transmitted to the online system more quickly, and they can also capture information in machine readable form from the online system. The latter capability has far-reaching implications for online searching in that with a microcomputer one can collect the output of a search, sign off the online system and then reformat the initial results before printing out an edited version of the final product. Microcomputers have also made possible the creation of online system interfaces that are more "user friendly," that is, sets of instructions and/or responses that are easier for a user to understand than the standard command language of search systems. Such interfaces can in some instances act as a more-or-less universal query language that allows the user to search quite different online systems with a common set of commands.

Regardless of the equipment actually used to communicate with the online system, most terminals function in a similar fashion. The keyboards of terminals resemble a typewriter with several additional keys. They communicate with the host computer through a modem built into the terminal or wired to it. A terminal operator establishes communications with the computer by dialing the telephone number for the search service or for the intermediary communications network (TYMNET, TELENET, UNINET, etc.). As soon as a shrill, steady tone comes through the receiver, or the proper indicator signal illuminates, the user connects the telephone to the acoustical coupling device and starts entering the necessary informaton to be logged in. As the keys on the keyboard are pressed, tones are emitted by the terminal. They are picked up by the telephone and transmitted to the host computer, which

deciphers the signals and responds to the instructions.

Instructions for logging on to an online system will vary slightly with the method by which the communication link is established. For specific directions about logging in, check the user manual for the online system you plan to use.

SECTION II

PRODUCING AGRICOLA TAPES

A. AGRICOLA DATABASE RECORDS

The AGRICOLA tapes are made up of thousands of unit records, individual bibliographic entries in a standard format consisting of both fixed and variable length segments. Fixed field segments describe particular elements of the citation such as language of publication, subject category codes, etc. and point to portions of the variable field segments, which contain the actual text elements of the citation (for example author's names, title, subject descriptors, etc.) Figure II-1 illustrates the formatting of information on a segment of a computer tape.

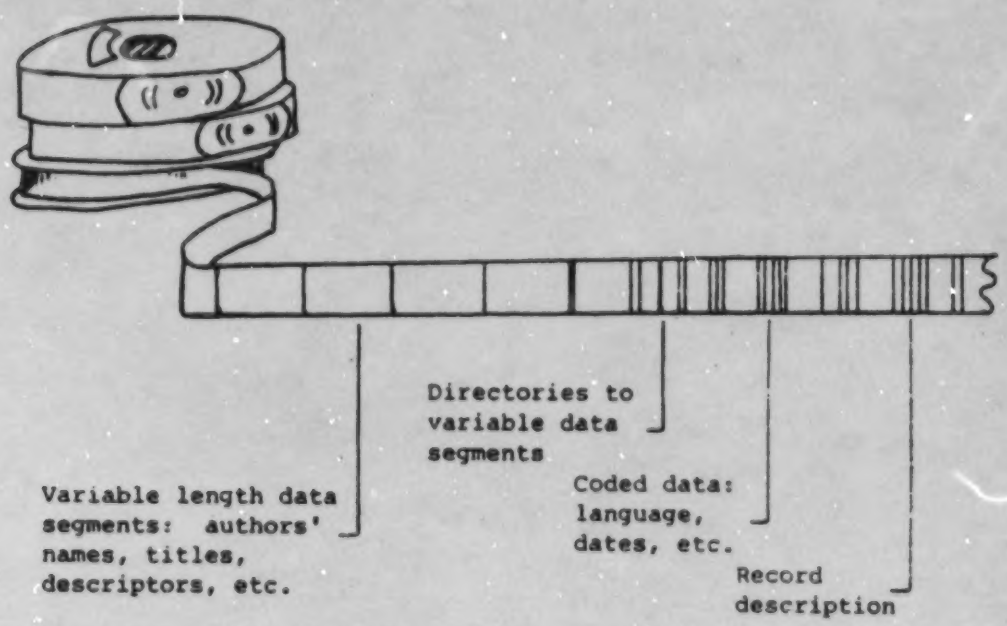

Directories to variable data segments
Variable length data segments: authors' names, titles, descriptors, etc.
Coded data: language, dates, etc.
Record description

Figure II-1. Data formatting

Those who use the AGRICOLA tapes either in batch mode or through their own online system can pull from this standardized record those elements of most interest to them.

Commercial online retrieval services take the AGRICOLA tape and select certain items from those unit records for searching in their own systems. Certainly, not all vendors will choose the same elements for online searching; therefore, close study should

be made of the structure of the online unit record described by each vendor. For instance, where one company may have chosen to make a particular field of the master unit record searchable, another may only print that field as part of a full citation without allowing it to be searched at all. Or where one company searches two master unit record categories as separate items, another may combine the categories for searching. See sections on the specific commercial systems for descriptions of those versions of the unit record as they have defined it.

B. INPUT SOURCES

The records which constitute the AGRICOLA database are created by several units both within and outside the U.S. Department of Agriculture. Figure II-2 shows the flow into the National Agricultural Library of records which become a part of AGRICOLA.

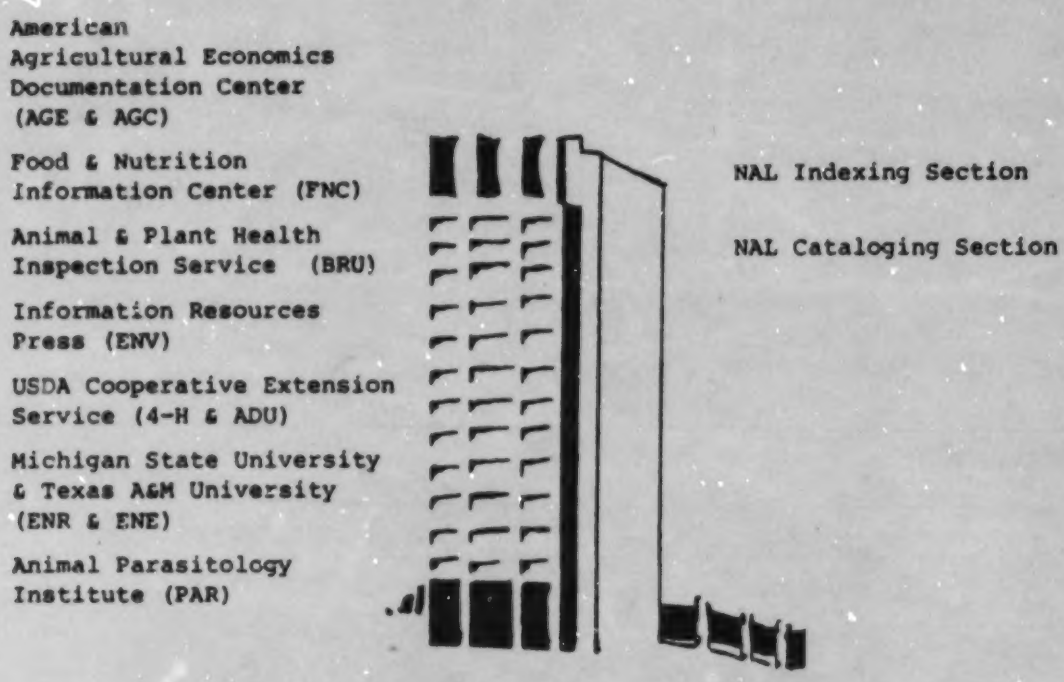

American Agricultural Economics Documentation Center (AGE & AGC)
Food & Nutrition Information Center (FNC)
Animal & Plant Health Inspection Service (BRU)
Information Resources Press (ENV)
USDA Cooperative Extension Service (4-H & ADU)
Michigan State University & Texas A&M University (ENR & ENE)
Animal Parasitology Institute (PAR)
NAL Indexing Section
NAL Cataloging Section

Figure II-2. Sources of information for the AGRICOLA database

The diversity of input sources, while undoubtedly enriching the database, has created for the searcher a number of retrieval problems. Input criteria are, today, relatively uniform, but over the history of the file this has not always been the case. Since the days of CAIN in the early 1970's, there have been three major changes in the subject category codes used by NAL. Both the Food and Nutrition Information Center and the American Agricultural Economics Documentation Center used for several years their own subject category codes and created records using different input criteria. In addition, over the years a number of specialized subfiles have been added to the database from organizations or projects outside NAL. These records have not fully conformed to the input standards in place at NAL and create unique searching problems.

This section will describe the unit records created by NAL units and the various other organizations and programs which have created records for the database.

C. NAL INDEXING RECORDS

Materials to be indexed must be selected, acquired, cataloged, recorded, and routed to the Indexing Section by other units of the Library. Indexing at NAL consists primarily in the entry of "analytics" or component parts of larger works. Some examples of indexed materials are journal articles, chapters in books, and monographs in series (if under 30 pages). Approximately 6,000 serials and many monographs are regularly scanned for items to be indexed and most of these items are ultimately published in the Bibliography of Agriculture. Indexing accounts for over 85 per cent of the AGRICOLA database. For other material, see section D, "Additional AGRICOLA Records," below. Indexers scan the material and select items according to criteria which will be explained in the paragraphs which follow.

What is indexed depends in part on the Library's collection policy. The Library collects exhaustively all significant publications of agricultural interest and less exhaustively publications in chemical, biological, and environmental areas. The coverage of agriculture, botany, and entomology is as complete as possible, given certain constraints of personnel and budget and the tendency of Federal and State governments to reorganize agencies, causing communication gaps. A case illustrative of this latter problem is NAL's less than complete coverage of materials dealing with wildlife and wildlife management, an area covered in depth by many agricultural libraries. NAL's responsibility for collecting in this area shifted several years ago when the

Department of Interior was given responsibility for much of this area. Since that time NAL's coverage in this area has been limited for the most part to the effect wildlife has on agricultural production, for example, wild animals as crop pests or as predators of domesticated animals. Legislative and administrative mandates also affect the database coverage. The 1977 farm bill, for instance, broadened the responsibility of NAL in the area of human nutrition. Where previously NAL had considered human metabolism and other biological aspects of nutrition in man to be outside the scope of the database, the new mandate required that this area be included.

Although AGRICOLA attempts to be as complete as possible in its coverage of items within NAL's defined areas of responsibility, gaps in coverage do occur for any of several reasons--some through unintentional oversights, and some as a result of established policies. Illustrative of the former cause is the problem of selecting serials for indexing. It is necessary to realize that the Indexing Section at NAL is only one part of a large library and its operations have often been affected by decisions on matters unrelated to its product--the NAL indexing portion of the AGRICOLA tape. A serial which was not selected for routing to the Indexing Section may have occasional articles within the scope of the Bibliography of Agriculture, or it may have changed its coverage since the routing decision was made. Such cases should be called to the Indexing Section's attention. Procedures in the day-to-day work flow in the library have on occasion resulted in gaps for the database as well. In large organizations such as NAL lapses in subscriptions inevitably occur and even when the subscriptions are active, issues of journals fail to get claimed from time to time. Until recently the Indexing Section had no real way of knowing whether a given issue of a journal had been received and indexed. Procedural changes have been instituted recently which should insure closer monitoring of indexed journals, but users will need to be alert to the possibility that certain issues of older journals may fail to have been included in the database. The second cause--gaps caused by NAL policy--is illustrated by the cases of microforms. Since the general policy has been established that microform materials will not be indexed, many government publications, FAO publications, and research reports acquired by the library only in microform will not have been picked up in AGRICOLA, except perhaps as serial cataloging records. As with all policies, the one on indexing of microforms is reviewed frequently, and recently a few selected types of materials have begun to be indexed for the database, for example ASAE papers. The Indexing Section's policy of not taking materials substantially over a year old may also cause gaps in the indexing records. This is especially true with foreign materials

received on exchange and where serial subscriptions have lapsed or where claiming of missing issues has been delayed.

While some types of materials will normally not show up in AGRICOLA at all, other items will regularly appear more than once on the tapes. Any material in an analyzed series which is reflected in NAL's public catalog and also published in the Bibliography of Agriculture, such as that in an important USDA, Experiment Station, or Extension Service series, and other separately paged series worthy of special note, will be on the AGRICOLA tape twice--once as an indexing record and once as a series analytic from cataloging. There will also be some duplicate items from the FNIC and the AGECON input into the file. The degree of duplication should be mitigated in recent years by changes in policy which have assigned responsibility to Indexing for monographs in series under 30 pages. The Cataloging Section handles longer such works.

The sections which follow will attempt first to explain the subject and nonsubject criteria used to select items to be indexed for the Bibliography of Agriculture, and second to outline the indexing and subject enrichment policies followed by NAL indexers. Thorough understanding of these policies should enable searchers to understand better the structure of the AGRICOLA files.

NONSUBJECT SELECTION CRITERIA FOR INDEXING

It is the general goal of the Indexing Section to create a bibliographic file of significant publications reflecting current research and practice in agriculture and its allied fields. To this end the following criteria regarding format, quality, and treatment are used by indexers in judging the suitability of a publication for inclusion in the database.

A. TIME

1. Items should be as current as possible, usually within the last 2 years. Exceptions will be made for selected classes of materials such as USDA publications, taxonomic literature, and the proceedings of important congresses and conferences.

2. The time period covered in publications of a statistical nature should normally cover at least a full year. Important statistical publications reporting data only on a shorter basis can be accepted. Purely statistical

compilations are, however, usually not indexed.

B. LENGTH

Articles should normally be at least one page long in order to be selected for indexing for AGRICOLA. An exception to this guideline is that taxonomic items dealing with plants or insects will be indexed regardless of length. Monographs in a series, if over 30 pages long, are reserved for the Cataloging Section.

C. FORMAT

Although the Indexing Section does handle materials aimed at those who are not specialists in agricultural sciences, the principal thrust of its effort is to select those items of scientific or professional value for the improvement of agricultural productivity. Consequently, indexers generally do not select items with a journalistic approach, that is news items, editorials, letters to the editor, pictorial essays, regular unsigned columns, and other such items. In addition, certain other types of publications are not indexed for AGRICOLA, even though they will be acquired for NAL collections and cataloging records will be input for them. They include the following:

Abstract/Summary Journals
Annual Reports
Bibliographies
Book Reviews
Catalogs
Directories
Dissertations
Herdbooks
Indexes
Leaflets
Loose-leaf Publications
News Bulletins
Newsletters
Newspapers
Popular Trade Journals
Register Books (Herdbooks)
Reprints
Seed Catalogs
Statistical Reports
Theses
Yearbooks

D. GENERAL EXCEPTIONS

The following types of materials may be included regardless of the limitations described above:

1. Articles in USDA publications and articles by USDA personnel as well as items about high-level USDA administrators.
2. Awards given to scientists for agricultural research, if at least one-half page long.
3. Biographies or obituaries of scientists connected with agriculture, if at least one-half page long.

SUBJECT SELECTION CRITERIA FOR INDEXING

In general, items are selected for indexing on the basis of their relevance to the fields of food and agriculture. The basic criteria for selection are outlined in the scope notes for the subject categories. (See Section II-E.) Additional subject criteria used in the selection process are outlined below.

Bacteria and Viruses

Articles on bacteria and viruses are selected on the basis of their relation to agricultural subjects. Items are selected in the following areas:

1. Pathogens of plants, insects, or livestock
2. Use of bacteria and viruses in biological control of insects and weeds
3. Symbiotic bacteria of plants
4. Soil microbiology
5. Rumen bacteria
6. Bacterial and viral contaminants of food or feed
7. Bacteria used in processing foods or other agricultural products
8. Bacteria as food or feed (single-cell protein)
9. Bacteria as affected by pesticides or pollution from agricultural sources
10. Bacteria used for energy production from biomass and wastes.

Plants

All items are selected on plants--from Cyanophyceae (blue-green algae) up through the higher plants--on the theory that they are all of potential agricultural interest. One exception to this rule has been the exclusion of fungi pathogenic to humans.

Invertebrates

All entomological literature is taken, again on the theory that it is all of potential interest to agricultural researchers. Selection in the classes Insecta, Myriapoda, and Arachnida is exhaustive. Only the terrestrial members of the class Isopoda (sowbugs, pillbugs) are selected for indexing.

Articles on other crustaceans are taken only if the organisms are treated as food or have other agricultural implications. Annelids are taken as they affect plants, livestock, or soil only. Mollusks are taken only if the organisms are treated as a food or have other agricultural implications (for example snails and slugs).

Insect parasites or pests of man have been taken throughout the history of the database, but other animal parasites or pathogens have--until 1983--been taken only when they affect agricultural subjects. Beginning in 1983, the scope of the database has been broadened to include other facets of human parasitology as well.

Vertebrates

All items are taken on livestock and other animals raised on farms (for example fur bearing animals raised in pens). Articles on laboratory animals of interest to veterinarians, agricultural research institutes, or specialists in human nutrition are taken. Articles relating to human pathology and physiology are excluded unless they relate to diseases of livestock or to diseases caused by contaminated food, malnutrition, nutritional deficiencies, nonfood agricultural products through the primary processing states, pesticides, or pollution from agricultural sources. Articles on vertebrate agricultural pests are assigned to subject categories according to the aspect covered, for example, plant pests (4520, F820's), stored grain pests, (2025, F850's), and so forth.

Fish and wildlife are taken in relation to their use as food, feed, or fertilizer; to their being raised on a farm (that is,

aquaculture); or to their being affected by pesticides or pollution from agricultural sources. Wildlife as it affects farm or forest operations is taken.

Weather

Articles on climate are taken if they treat the climate as it affects agriculture. Prior to 1980, information on weather and climate was indexed in the category most appropriate to the organism, structure, or process affected, for example general agriculture in 0505; field crop physiology in 4035; field crop culture in 4050; animal production in 2505; construction of animal housing in 5505; and so on. Since 1980 the code B200 (Meteorology and Climatology) has been available for use in indexing.

Agricultural Economics and Sociology

All articles on agricultural economics, rural developement, rural sociology, and rural health are taken; but many relevant articles may appear in journals to which the Library does not subscribe because their overall content relevant to agriculture is low. The economics of synthetic products is taken when the products are in competition with agricultural products.

Agricultural Products

Items are selected on agricultural products, taken only through their primary processsing stages. Articles on manufacturing processes after primary off-farm processing are taken only when they relate to consumer protection (standardization, inspection, quality control, contamination, and so forth). Treatment of specific products is discussed below:

1. Textiles from natural fibers are taken through the spinning process. This includes rotproofing, waterproofing, fireproofing, and the like. Further processing states are taken only when emphasis is on the properties of the fiber.

2. Pulp and paper are taken through the pulping process but not the actual paper sheet production process, except where this process is affected by the properties of the wood or other natural fibers.

3. Tobacco is taken as a raw product or derivative, but cigar or cigarette manufacture is not, unless the emphasis is on the raw material.

4. Natural rubber is taken through initial processing of the latex. Articles on further processing or on synthetic rubber are taken only as they relate to the properties of natural rubber.

5. Extracts are taken if they are from insects and plants, but not if they are from domestic animals (unless related to agricultural subjects in other categories).

6. Furniture and building materials for other than farm structures are taken only in relation to their agricultural or forest product content.

7. Food products are taken through all stages of processing, but not in relation to the machinery, management and labor, or economics of their manufacture unless that aspect is concerned with the properties of the raw materials.

To illustrate how these criteria are used in practice, one article on starch content of potatoes as it is a factor in damage resulting from mechanical harvesters would be accepted because it deals with a property of the crop itself. Another article discussing a new potato canning machine, however, would not be within scope unless the new machine somehow affected the quality of the potatoes themselves.

INDEXING PRACTICES

Title Enrichment

Unlike the Cataloging Section, FNIC, and AAEDC, the Indexing Section at NAL has had no single vocabulary authority except for a list of geographic descriptors. A vocabulary control tool for indexing has been under consideration for some time, and one may very likely be adopted in the near future. Subject retrievability of existing indexing records has been improved, however, through the practice of title enrichment, that is, through the addition of explanatory terms to the titles of articles. Over one-half of the items input by the Indexing Section are enriched according to the following criteria:

1. Ambiguous titles should be clarified.

2. Each title should contain the scientific name for insects, agriculturally important nematodes and pathogenic organisms, and the following plants: grasses, shade trees, forest trees, nut trees, ornamental plants, drug plants (except castorbeans), spice plants, essential oil plants, rubber plants, weeds, poisonous plants, miscellaneous economic plants, and plants of unknown use.

3. Each title should contain the common name of domestic animals, diseases (when English language form is available), and the following plants: cereals, fibers, forages (except grasses), edible oil crops, sugar, tobacco, fruits, vegetables, coffee, tea and cocoa.

4. Chemical terms in titles should be enriched by an approved common name, if readily available or if provided in the article.

5. A title should be enriched if an important subject term is abbreviated (except for abbreviations listed in Agricultural Terms, Oryx Press, 1978). If the common name of an abbreviated chemical name cannot be found, the full chemical name is used.

6. The title of a biographical article lacking the name of the profession to which the person belongs should be enriched with the profession (and the country when needed).

7. Articles on nematode plant diseases not containing the word "nematode" or "nematodes" should be enriched by one of those terms (begun in 1974).

8. Articles on lower plants (below the spermatophytes) are enriched with the division or more general name, if not already in the title; for example, Cyanophyta, Pteridophyta, algae, lichens, and the like (begun 1975).

9. Articles including new taxa of insects or plants are enriched with "new taxa" if the title does not include the word "new" (begun 1975).

10. Articles on plant varieties or cultivars not including those words are enriched.

11. Articles on diseases are enriched with names of the host and parasite or pathogen if they are not mentioned in the title.

12. Geographic enrichment is used when it is needed to clarify the title meaning unless the journal title or language code indicates the area concerned. Terms for enrichment can be more specific than those from the list of geographic descriptors (subject terms). The appropriate geographic descriptor must be added to the subject term field; for example, Appalachia add United States, Warsaw add Poland, and so on. See the list of geographic descriptors at the end of section II for approved forms of terms.

In enriching titles, NAL indexers have followed the "Rule of Three"; that is, enrichment terms for organisms, crops, chemicals, or other subject areas up to the number of three may be added. If the subjects in an article exceed that number, a general term is used for enrichment, provided that it is not already part of the title. For example, an article on corn, wheat, millet, and oats may be enriched with the term "cereals." This rule is exceeded from time to time where the addition of more terms is deemed especially important for a particular article.

It should be kept in mind that the general purpose of the title enrichment practice is to improve the retrievability of titles which alone may be unclear and, therefore, unretrievable in a subject search. Enrichment terms will not, however, have been added consistently to those titles that contain a word implying the broader category to which that term belongs. To illustrate, a title containing a term such as "ewes" or "lambs" will not necessarily be enriched with "sheep." The searcher interested in a comprehensive search on this animal should as a matter of standard practice search on all forms of terms which could refer to sheep. This rule holds true for all other animals and plants as well.

All enrichment terms are entered as part of the title field and may be searched just as any other terms in that field.. Their placement in the title has posed a number of special searching problems, especially for users who were trying to verify a bibliographic reference. For example, the title "Small Grain Performance Related to Soil Moisture" might very well have been enriched by the terms "wheat" and "sorghum." Those terms would have been added following the term they enriched, that is, the title as it would appear in the database would read, "Small Grain (Wheat, Sorghum) Performance Related to Soil Moisture." While the

interpolation of words into titles increases the chances that searchers will retrieve more of the items they are seeking, it also means that they may fail to retrieve that single citation they are looking for when their strategies involve searching for a specific sequence of words.

Since 1982 indexers have changed their practices in regard to the placement of enrichment terms in titles. Now enrichment terms are added at the end of the title. This practice should ease the problems in verifying recent publications in the file, but records created prior to 1982 must still be searched with care.

Category Codes

Each record prepared by the Indexing Section is assigned at least one subject category code. There have been three standards which have been used in the assignment of codes over the course of the database. A very general one was used during 1970 and 1971; a much more detailed scheme was introduced in 1972 and was used until 1980. Beginning in 1980 an alphanumeric coding scheme, compatible with the codes used by FAO in its Agrindex, has been the standard employed by indexers. Brief descriptions of the two earlier codes are given later in this section along with a full explanation and cross-reference guide for the current codes. The policies which govern the assignment of category codes are described in the paragraphs which follow.

The main subject or purpose of an article determines the assignment to a subject category. A general category is not used when a more specific category is available. In assigning categories, the following subjects take precedence: (1) insect vectors, (2) diseases, and (3) pesticides.

Double categories can be used on different subjects; but since items assigned double codes had, at one time, to be printed twice in the Bibliography of Agriculture, the practice was limited for reasons of economy. In some instances, however, double indexing was deemed necessary as a regular practice. For example, most articles on pesticides are double indexed throughout most of the file, so that articles on pesticide residues in food will be indexed in H000 (or 4560) and the Q200's (or 1505). Similarly, many insect-related papers were regularly double indexed; thus articles on insects transmitting viral diseases to plants will be indexed in F833 (or 4515) plus the appropriate insect categories. Double indexing in other cases will depend on the length and scientific interest of the article. Recent changes in the computer system used in the production of AGRICOLA tapes have made

possible the more widespread use of double indexing, but for the vast majority of citations in the file (up to the 1980's) the practice has been limited.

If more than two kinds of crops or types of diseases are the subject of an article, the article is placed in a general subject category: for example, plant physiology in F600 (or 4030), plant diseases in F830 (or 4520), animal diseases in L830 or (3005), plant insect pests and control in F821 (or 4530), and so forth. If two kinds are mentioned, the article may be double indexed if both organisms are discussed substantively; otherwise that article, too, will be placed in a general subject category.

If many aspects of a crop are mentioned (physiology, culture, disease, and insect pests), the subject category for culture is chosen--field crops in F120 (4050), horticultural crops in F110 (4055), miscellaneous crops in F140 (4060), and forest trees in K100 (3515). Crops are assigned to subject categories according to use: for example growing turnips as a vegetable is in F110 (4055), but turnips as a forage are in F120 (4050); and oaks as shade trees go in F110 (4055), while oaks as forest trees go in K100 (3515), and so forth. See section II-E for a complete list of the subject categories and the guidelines for their application.

Geographics

Geographical subject headings have been added since 1973. The list used at that time was compatible with the geographic descriptors used in cataloging records, but the list was not complete and was based on political boundaries only. Beginning in 1975, the list was expanded to include some areas larger than the political unit, and the list is expanded further when necessry. The geographic terms are usually added into a descriptor field. See section II-F for a list of geographic descriptors.

Translations

The Indexing Section takes articles translated into English, mainly from journals that are cover-to-cover translations, and adds the citation to the original article in the note field if it is readily available. The only other translations indexed are those which accompany the original foreign language article (frequently Canadian or South African publications). There are presently several thousand such articles in the database which have been processed by the Indexing Section. The other

translations in the file are cataloging items.

Notes

Two standard notes are added to indexing records. "Eng. Sum." is added for all foreign language items containing a summary in English. Items containing bibliographic references may also bear either the simple note "Ref." (in the older part of the database) or a note stating that the items includes references (newer citations). Both the note regarding summaries and the note about bibliographic references were entered into the source field in the AGRICOLA records through 1978. Since that time, that information may have been also placed in the notes field, which is also used by indexers to enter statements regarding full text translations into English or some other language which accompany the piece being indexed. In recent years indexers have also used the notes field to provide information about conferences and symposiums. Whether this information is searchable online depends on the specific system being employed.

Reviews and Bibliographies

Review articles and articles with substantial bibliographies (three or more average size pages of references) are tagged. Bibliographies have been noted since 1974 and reviews since 1975. Again, the searchability of this information depends on the online search system being used.

Corporate Authors

Authority files for corporate authors are maintained and used for both indexing and cataloging records. The AGRICOLA database is, however, created by adding the contents of monthly sale tapes to the already existing files; extant records are not regenerated nor are global changes made to the online database when the form of entry for a corporate body is changed. This means, therefore, that although one form of entry is used in creating records at any point in time, the database as a whole may contain various forms of entry for the same corporate body.

Few corporate authors are entered in the indexing records, however, except for those of the USDA, State Extension Services, state experiment stations, and FAO. These are entered and may be searched by State, with the exception of extension publications of those land grant institutions which do not include the name of the

State in their names: Auburn, Clemson, Purdue, and Rutgers.

Personal Authors

In earlier records indexers listed up to ten authors. If there were more than ten, nine were listed and "et al" was generated by the computer in the tenth place of the author field. The present policy is to list up to five authors for most publications and all authors (within space limits in the computer record) for USDA publications.

The form of the names entered in this field follows the pattern of LAST NAME, INITIAL INITIAL, (through 1979) and LAST NAME, INITIAL. INITIAL. (since 1979). That is, through 1979 works signed by John F. Smith would have appeared under SMITH, J F, and since 1979 they would be entered under SMITH, J. F. The Indexing Section uses no authority list for the establishment of personal names: the entry is generated strictly from the form appearing with the piece being indexed. It is conceivable, therefore, that there could be found in the database several variant forms of entry in indexing records for articles by the same author. For instance, if John F. Smith signed his full name for one article, it would be entered with both initials--SMITH, J F--in the author field, but if he used only "John Smith" in another article, that work would have only SMITH, J in the author field.

The use of initials for authors' given names raises another matter which must be remembered, that of retrieving totally irrelevant entries during searches of the author field. A search on "Smith, J F" will retrieve most of John F. Smith's articles in the database, but that search will at the same time retrieve works by James F. Smith and Jason F. Smith. Irrelevancies can be minimized, however, by coupling the personal author's name with some other narrowing pieces of information, such as category codes or other subject related terms.

D. ADDITIONAL AGRICOLA RECORDS

Although the largest single source of records in the AGRICOLA database is the NAL Indexing Section, a substantial number of records are also prepared by the NAL Cataloging Section. These two units of NAL are responsible for approximately 95 per cent of all records in AGRICOLA. The remaining AGRICOLA records are prepared by the staff of centers such as the Food and Nutrition

Information Center and the American Agricultural Economics Documentation Center or by other cooperating institutions.

1. NAL Cataloging Records

Approximately 19,000 records are input into the AGRICOLA database by the Cataloging Section each year. All cataloging records are ultimately published in the National Agricultural Library Catalog (Rowman and Littlefield). These include cataloging records for periodical and other serial titles, monographs, translations, series analytics, microforms, and other materials processed for the NAL collections. The next few paragraphs will elaborate on some of the NAL cataloging practices that have an effect on retrieval of information from the AGRICOLA file.

Main Entries and Titles

The Cataloging Section at NAL follows standard library cataloging practice in choice and form of entry for its records. Authority files are maintained by the section for both personal authors and corporate bodies. Insofar as it is possible, the Indexing and the Cataloging Sections use the same form of entry for corporate bodies. Personal authors' names are, however, much less uniform throughout the database because of different practices followed by the NAL Cataloging Section and other units such as the Indexing Section, AAEDC, and FNIC. Thus, to retrieve items in the file by a particular author, searchers must use not only the formally established form of the name in order to obtain records input by catalogers, but they must also use several other possible forms of the name in order to retrieve records created by units such as Indexing, FNIC, or AAEDC. To give an extreme--but altogether feasible--example, consider works by a hypothetical author, Ellen C. Jones, who publishes in the field of nutrition. Works of hers processed by the Cataloging Section would have a fully established entry such as "Jones, Ellen C., 1938-." Indexers, on the other hand, would use the abbreviated form of her name as they would be able to derive it from the title page of an article. Thus, it might appear as "Jones, E C" or "Jones, E"--depending on how she signed the article. The name may also appear simply as "Jones, Ellen" or "Jones, Ellen C" if any of her publications had been handled by the Food and Nutrition Information Center, since their practice has been to use the full form of the name as it appears on the work.

Titles of foreign language items are translated, and titles in languages not using Latin or Romanized alphabets are transliterated as well as translated. Due to vendor preferences, cataloging records in the AGRICOLA database vary from standard cataloging practice in that all diacritical marks are omitted from foreign language items.

Unit Record Authorities

The form of entry for corporate authors, personal authors, and serial titles follows Anglo-American Cataloging Rules. Abbreviated titles of serials are constructed according to the rules of the American National Standards Institute (ANSI). MARC language codes are used.

Authors' names and specialized vernacular terms, such as Russian takyr (soil), appearing in other than Roman alphabets are Romanized according to the following systems:

1. Slavic languages in the Cyrillic alphabet including Russian, Ukrainian, Belorussian, Bulgarian, Serbian, Slovene, and Macedonian, follow the Library of Congress system.

2. Chinese follows the Wade-Giles system.

3. Japanese follows the Hepburn system.

4. Korean follows the McCune-Reischauer system.

A general exception to these standards is made in the case of items in oriental languages for which a Romanized form is provided with the publication. In those instances the spelling is accepted unchanged from the source. Thus, one will find, for example, both Wade-Giles and Pinyin versions for Chinese language items in the database. Diacritical marks in foreign names and titles are simply omitted by online vendors, regardless of language.

Vocabulary Aids

Useful references for vocabulary choices include the following:

1. Agricultural/Biological Vocabulary, volume 1 and supplement, 1967 and 1968. Reprinted 1976.

2. Annual subject indexes of the Bibliography of

Agriculture, particularly the 1969 index.

3. Agricultural Terms, 1978, Oryx Press, which will be useful for finding synonyms and related terms for searching.

Call Numbers

Since 1966 NAL has used the Library of Congress classification scheme. Prior to that time, the Library used its own classification system. (See the end of this part of the chapter for summaries of both schemes.) Since there are no plans for reclassifying the collections, many of the serial titles which appear in the AGRICOLA database will bear the old NAL call numbers. Newly cataloged items added to these long-established series, as well as items indexed from periodicals cataloged prior to 1966, will continue to be assigned the old NAL call number.

Knowing the NAL call number for a long-established title can help in trying to search for publications from a given source, such as State agricultural experiment stations or extension services. While governmental agencies and their publications exhibit the most frustrating proclivities toward name changes, call numbers tend to be more stable and are a good way of searching for works issued by a given corporate source. For instance, 275.29 K13 with appropriate truncation will retrieve the items from the Kansas State Agricultural Extension Service which were cataloged prior to 1966. One caution, however, must be observed when using this technique. The AGRICOLA database is a cumulative record only; therefore, any changes that a serial undergoes which result in the creation of a new cataloging record will be reflected in the database only from the time the new record is entered. Preexisting records are not updated in AGRICOLA. The new serial record simply contains a note referring to the old entry. The change is cataloged as a new item, but the previously assigned call number is retained for all the old records. However, if two serials, A and B, combine to form a new title, C, which has a new call number, the old records for titles A and B will not be updated in the database. To perform a complete search, then, one must search either the call numbers or titles for both the old and the new serials.

Journal Titles and Abbreviations, published by Oryx Press in 1982, is a convenient source of the call numbers and the journal title abbreviations for most of the serials in the database.

Call numbers based on the NAL classification scheme are always entered on the AGRICOLA tape with a space between the class number and the book number; for example, 424.8 G47. Library of Congress system call numbers, on the other hand, are entered without spaces except for a date as part of the number; for example, SB351.P3P3 or TX739.C3 1971.

A lowercase "a" before an LC call number or a capital "A" before an NAL call number identifies a publication issued by the U.S. Department of Agriculture. Thus, one will find call numbers in the file such as "aHT393.G42R3" and "A428.3 R16." Other special types of materials are similarly identified, such as "Fo" for folios, "J" for juvenile literature, and "R" for items in the rare book collections.

Subject Headings

NAL adopted Library of Congress subject headings beginning in July 1972. Prior to that time it used the National Agricultural Library Subject Heading List. For thorough coverage of records cataloged between 1970 and 1972, therefore, one should consult both authority lists for potential search terms.

All subject headings and geographic descriptors are entered into a separate field in the AGRICOLA unit record. Subdivisions to a subject heading are entered as separate, tagged items in the unit record and generally must be searched separately. For example, the subject heading AGRICULTURE--ECONOMIC ASPECTS will appear in most versions of the AGRICOLA record as two headings: AGRICULTURE and ECONOMIC ASPECTS. Treatment of the subject headings and geographic descriptors varies substantially from one retrieval system to another, so the search analyst should review the sections of this manual appropriate to the retrieval system to be used.

In addition, all cataloging records are assigned NAL subject category codes and source codes. Catalogers use the entire range of subject category codes, including the rather general auxiliary codes.

Series Statements and Notes

The NAL Cataloging Section does analytics for all the major agricultural experiment station series and for major monographic

series that fall within both the defined scope of the NAL collection and certain page length limitations. For example, monographs in a series are handled by the Indexing Section if they are under 30 pages long. Series statements are prepared for cataloging records according to standard library cataloging practice. Series statements can appear in the AGRICOLA unit record in either the "series" field or the "notes" field.

Other information regarding such things as bibliographies, summaries in English or other languages, previous publication in another form, and so forth are entered in the notes field, following standard library practice.

Translations

The Cataloging Section processes several hundred items each year for the NAL Translation Collection. This collection consists of on-demand translations of book chapters, articles, papers, and reports which have been purchased for USDA research staff. About 19,000 of these translations have been added to this collection since 1970. The call number for an item in the Translation Collection is simply TRANSL plus an accession number. In these records the original language titles appear, when available, as well as translated titles. All the items in this collection are identified as monographs, regardless of their actual format.

Until recently, titles and authors' names are entered exactly as given in the translation. In the case of items in non-Roman alphabets the translator's choice of transliteration standard was accepted, regardless whether it is the standard used by NAL; thus it is possible that works by Sergei Chernevski might also appear in the database under the name "Sergei Chernevskii." All diacriticals on the original cataloging record are stripped from the AGRICOLA sale tapes and, consequently, do not appear in the online database. No adjustments are made to words--as is frequently done in the case of umlauts--so a German name represented in English as Mueller would become Muller in the database. Recently an effort has been made to follow more closely the transliteration and Romanization forms of the Library of Congress, which should ease the task of searching some foreign names.

NAL CLASSIFICATION NUMBERS IN THE AGRICOLA FILE

Numbers following this scheme are applied to serials and monographs in series which have not been converted to the Library of Congress classification system, which was introduced into NAL in 1966.

AGRICULTURE

1 USDA publications (until November 1953 at which time subject classification preceded by the letter "A" was used. Use of "A" continued with changeover to LC classification in 1966.)

AGRICULTURE--U.S.

2 State agricultural reports
3 Agricultural societies before 1840
4 Agricultural societies since 1840
5 Agricultural congresses and conventions
6 Agricultural periodicals

AGRICULTURE--FOREIGN COUNTRIES

7 British America
8 Mexico, Central America, and West Indies
9 South America
10 Europe
11 Scandinavia and Iceland
12 Netherlands
13 Belgium
14 France
15 Spain and Portugal
16 Italy
17 Switzerland
18 Germany
19 Austria, Hungary, and Czechoslovakia
20 USSR, Finland and Poland
21 Balkan countries
22 Asia (except USSR)
23 Australasia
24 Africa
25 Other (Turkey, Philippines, Indonesia, etc.)
26 Tropical countries
27 Foreign congresses
28 International institutions
30 Agriculture in general

31-38 Agriculture, arranged geographically

ANIMAL HUSBANDRY

40 Domestic animals: goats and rabbits
41 Veterinary medicine (Parasitic diseases in 436)
42 Horses
43 Cattle
44 Dairying
45 Sheep and wool
46 Swine
47 Poultry (wild birds in 413)
48 Dogs and pets
49 Livestock
50 Meat inspection

SOIL

53 Tillage (including dry farming)
54 Drainage
55 Irrigation
56 Soils
57 Fertilizers and soil amendments

58 Agricultural implements, machinery, and processes

CROPS

59 Cereals
60 Forage crops
61 Seeds
64 Crops (see also special crops 59-61, 65-77)
65 Sugar
66 Sugar beets
67 Sorghum and miscellaneous sugar crops
68 Beverage and condiment plants
69 Tobacco
70 Hops
71 Drug and medicinal plants
72 Cotton
73 Fiber and textile plants
75 Potatoes
77 Miscellaneous technical plants
78 Rubber
79 Farm pests and weeds

HORTICULTURE AND LANDSCAPE ART

80 Horticultural periodicals

81-89 Societies, boards and institutions, geographically

90 Horticulture in general
91 Vegetables
93 Pomology and Fruits
94 Small fruits and nuts
95 Grapes and viticulture
96 Floriculture
97 Gardens
98 Landscape art, parks, etc.

99 Forestry

AGRICULTURAL COLLEGES AND
EXPERIMENT STATIONS

100 United States
101 British America
102 Latin America
103 Great Britain
104 Scandinavia and Iceland
105 Belgium, Netherlands, France, Italy, Switzerland, Spain, Portugal, Germany, Austria, Hungary, and Czechoslovakia
106 USSR, Finland, Poland, Bulgaria, Rumania, Greece, and Yugoslavia
107 Asia
108 Africa
109 Australasia and Oceania

UNITED STATES PUBLIC DOCUMENTS

148 Congress
149 President
150 State Department
151 Treasury
152 War Department
153 Navy
154 Justice Department
156 Department of the Interior
157 Department of Commerce
158 Department of Labor
161-195 Independent agencies
166 Farm Credit Administration and Farmer Cooperation Service
173 Miscellaneous agencies

250-273 Statistics
274 Law
275-276 Education (includes extension)

ECONOMICS

277 Economic history
278 Economic geography
279 Conservation of natural resources
280 Economics: Cooperation, marketing, and planning
281 Agricultural economics
282 Land and rent
283 Labor and wages, etc.
284 Finance
285 Tariff
286 Commerce
287 Boards of trade, chambers of commerce, and exchanges

TECHNOLOGY

288 Roads
289 Transportation (general)
290 Civil engineering
291 Mechanical engineering
292 Water supply
293 Sewerage
294 Mining, metal working, and mineral industries
295 Refrigeration and cold storage
296 Architecture
297 Manufactures
298 Milling
299 Clay and rock products
300 Wood preservation, seasoning, and drying (see also 464.07)
301 Wood distillation and wood waste utilization
302 Paper
303 Leather and fur industries
304 Textiles
305 Rubber
306 Paints, dyes and bleaches
307 Fats and oils, soap, lubricants, and waxes
308 Essential oils, perfumery, and flavoring extracts
309 Miscellaneous manufactures
310-314 Patents and exhibitions

321 Home economics

325 Mathematics

PHYSICAL SCIENCES

330 Science--general reports and research
331 Geography

332 Photography
333 Aeronautics
334 Physics
335 Electricity, electronics
340-346 Meteorology

CHEMISTRY

Periodicals and societies:

381 U.S. and Canada
382 Great Britain
383 French
384 German
385 Other

386 General works
387 Analysis
388 Chemical technology
389 Food
390 Fermentation, enzymes
391 Toxicology
395 Agricultural chemistry
396 Pharmacy (veterinary drugs in 41)
398-408 Geology and Mineralogy
409-410 Natural history
411 General zoology
412 Mammalia
413 Ornithology
414 Fishes
415 Reptilia and batrachia

ENTOMOLOGY

420 Societies
421 Periodicals
422 General works
423 Economic entomology, insecticides

Systematics

424 Apiculture (see also with prefix BEE)
425 Sericulture
426 Hymenoptera
427 Coleoptera
428 Diptera
429 Orthoptera
430 Lepidoptera
431 Hemiptera

432 Neuroptera
433 Myriapoda
434 Arachnida
435 Crustacea
436 Worms and animal parasites
439 Protozoa

440 Microscopy
442 Biology
443 Evolution, genetics and heredity
444 Comparative anatomy and physiology
447 Human anatomy, physiology and histology
448 Medicine (Parasitic diseases in 436)
449 Hygiene

BOTANY

450 Periodicals
451 Societies, boards, institutions
452-460 Systematic and descriptive catalogs, geographically

461 Cryptogams
462 Fungi
463 General works, textbooks, and handbooks
464 Phytopathology

SCIENTIFIC PERIODICALS

470 American
472 English
473 French
474 German
475 Other

LEARNED SOCIETIES

500 United States
501 Great Britain
502 Scandinavia and Iceland
503 Netherlands
504 Belgium
505 France
506 Spain and Portugal
507 Italy
508 Switzerland
509 Germany
510 Austria, Hungary, Czechoslovakia, and Yugoslavia

511 USSR and Finland
512 Greece, Rumania, Bulgaria, Poland and Albania
513 Asia
514 Australasia
515 Africa
516 Latin America
517 British North America

LC CLASSIFICATION NUMBERS IN AGRICOLA

Nearly 90% of all new materials are classified in four schedules: H (Social Sciences), Q (Science), S (Agriculture), and T (Technology). This classification scheme has been used for the processing of newly cataloged serials and monographs since 1966.

A	General Works
B	Philosophy, Psychology, Religion
C	Auxiliary Sciences of History
D	History: General and Old World
E-F	History: Western Hemisphere
G	Geography, Maps, Oceanography, Anthropology, Recreation
H	Social Sciences (General)
HA	Statistics (Including collections of general and census statistics of special countries)
HB	Economic Theory (Including value, price, wealth, capital, interest, profit, and consumption)
HC	Economic history and conditions. National Production
HD	Land, Agriculture, Industry:
1-91	Production, Industrial management
101-1391	Land (Including public lands, real estate, land tenure)
1401-2210	Agricultural economics (Including agricultural laborers)
4801-8942	Labor (Including wages, strikes, unemployment, labor unions, industrial relations, social security, professions, state labor)
9000-9999	Special industries and trades
HE	Transportation and communication
HF	Commerce
294-343	Boards of trade, Chambers of Commerce
1701-2701	Tariff policy
HG	Finance
201-4000	Money, banking, credit, foreign exchange
HJ	Public finance
HM	Sociology
HN	Social history, social problems, social reform
HQ	Social groups
HS	Societies: Secret, benevolent, etc.
HT	Communities, classes, races
101-384	Urban sociology
390-395	Regional planning
401-425	Rural sociology
601-1445	Social classes
1501-1595	Races
HV	Social pathology. Social and public health. Criminology.
HX	Socialism,. Communism. Anarchism.
J	Political science

K	Law
L	Education
M	Music
N	Fine arts
P	Philology. Linguistics. Literature.
Q	Science (General)
QA	Mathematics
QB	Astronomy
QC	Physics
QD	Chemistry
71-142	Analytical chemistry
146-197	Inorganic chemistry
241-441	Organic chemistry
450-731	Physical and theoretical chemistry
901-999	Crystallography
QE	Geology
QH	Natural history (General)
75-77	Nature conservation. Landscape protection.
201-278	Microscopy
301-705	General biology (including genetics, reproduction, life, ecology, cytology)
QK	Botany
641-673	Plant anatomy
710-899	Plant physiology
901-938	Plant ecology
QL	Zoology
750-795	Animal behavior and psychology
801-950	Anatomy
951-991	Embryology
QM	Human anatomy
QP	Physiology
QR	Microbiology
R	Medicine. Public and rural health. Toxicology. Pharmacology.
S	Agriculture (general)
560-575	Farm managment. Farm economics.
583-589	Agricultural chemistry and physics
590-599	Soils
605-621	Reclamation and irrigation of farm land
622-627	Soil conservation
631-667	Fertilizers and soil improvement
671-760	Farm machinery and engineering
900-972	Conservation of natural resources
SB	Plant culture
110-112	Methods for special areas (including dry-land and tropical agriculture, irrigation farming, etc.)
114-118	Seeds
119-125	Propagation

183-317	Field crops
318-450	Horticulture
451-466	Gardens and gardening
469-479	Landscape gardening
481-485	Parks and public reservations
599-999	Diseases and pests
SD	Forestry
391-409	Siliviculture
411-428	Conservation and protection
430-557	Exploitation and utilization
561-668	Forest policy and administraton
SF	Animal culture
91-92	Housing and environmental control
95-99	Feeds and feeding
105-109	Breeds and breeding
114-121	Exhibitions. Judging. Stock shows.
191-275	Cattle
277-359	Horses
371-379	Sheep. Wool.
381-386	Goats
391-397	Swine
402-513	Fur-bearing animals. Laboratory animals. Pets. Birds (including poultry).
521-561	Insects
600-1100	Veterinary medicine.
SH	Aquaculture. Fisheries. Angling.
SK	Hunting. Wildlife management. Game protection.
T	Technology (general)
TA	Engineering (general)
TC	Hydraulic engineering
TD	Environmental technology. Sanitary engineering.
TE	Highway engineering
TF	Railroad engineering
TG	Bridge engineering
TH	Building construction
TJ	Mechanical engineering
1480-1496	Agricultural machinery
TK	Electrical engineering. Electronics. Nuclear engineering.
TL	Motor vehicles. Aeronautics. Astronautics.
TP	Chemical Technology
200-248	Manufacture and use of chemicals
368-406	Food processing and manufacture
500-659	Fermentation industries. Beverages.
890-933	Textile dyeing and printing
TR	Photography
TS	Manufactures
800-937	Wood technology

940-1070 Leather industries. Tanning.
1080-1268 Paper manufacture. Woodpulp industry.
1300-1865 Textile industries
1870-1935 Rubber industry
1950-1982 Animal products
2120-2159 Cereals and flour. Milling industry.
2220-2283 Tobacco industry
TT Handicrafts. Arts and Crafts.
TX Home economics
301-339 The house
341-641 Nutrition. Foods and food supply.
645-840 Cookery
901-953 Hotels, restaurants, taverns. Food service.
U-V Military and Naval sciences
Z Bibliography. Library Science.

2. Food and Nutrition Information Center (FNIC) Records

The Food and Nutrition Information Center (FNIC) was initially a cooperative effort of the National Agricultural Library and the Food and Nutrition Service of the U.S. Department of Agriculture. At its inception, the center was designed to collect and disseminate information on institutional food service and nutrition education to professionals in these fields. In October of 1981, FNIC was made part of the newly established Human Nutrition Information Service of USDA, and as of the Fall of 1983 has been made a part of NAL. The center's primary function today is to assemble, maintain, and disseminate information on food and nutrition to professionals and other interested persons throughout the Nation.

The Collection

The center assembles and maintains a collection of materials on nutrition research, nutrition education, and food management that are useful to school food service personnel, researchers, educators, dietitians, nutritionists, and consumers. Food service management and training, food habits, and various aspects of food technology are among the topics covered by FNIC.

The materials in the center include books, journal articles, pamphlets, government documents, special reports, proceedings, bibliographies, and similar items. In addition, FNIC maintains a collection of nonprint media in the form of motion pictures, filmstrips, slides, games, charts, audiotapes, and videocassettes. Materials of substantial interest to the school food service and nutrition education community are selected for inclusion in the printed catalogs of the center; these items are also included in the AGRICOLA tapes. The center is a depository as well for the materials used in the Supplemental Feeding Program for Women, Infants, and Children (WIC) and the Commodity Supplemental Food (CSF) programs. These items have been added to the online file, and they have been listed in the Nutrition Education Resources Guide published in October 1982 by USDA. References in the guide contain substantial abstracts, evaluative comments, and an assessment of reading level. There are well over 300 items in the WIC collection housed in the center.

Subject Indexing

Items from the FNIC collection are indexed with terms drawn from a specialized controlled vocabulary that was developed for this

collection. Many of these controlled subject terms are multiword phrases that can be searched in the precoordinated forms directly, for example, PLANT PROTEIN CONCENTRATES or SYNTHETIC FOODS. Check individual system sections for searching these terms.

An informative abstract, extract, or annotation is part of each FNIC record. The controlled vocabulary and the abstracts are supplemented by assignment of a numerical subject code to each item. (See the end of this section for a complete list of the codes.) Some of the category code numbers used by the Food and Nutrition Information Center during the period 1970 through 1980 are identical in form (though with different definition and scope) to category codes used by the NAL Indexing and Cataloging Sections. Because the subject scope of the FNIC codes is slightly different from the scope defined for identical indexing/cataloging category codes, and because additional unique codes were used during 1979, the user should be careful when choosing to employ code numbers in a search strategy.

Users who anticipate heavy use of AGRICOLA for searching the FNIC files may wish to acquire a copy of the controlled vocabulary used by the center's staff. It can be obtained directly from the Food and Nutrition Information Center, Room 304, National Agricultural Library Building, Beltsville, Maryland 20705. Printed copies of the FNIC catalogs are also valuable as search tools, and copies can be purchased from Oryx Press.

Names

The names of personal authors whose work is represented in the FNIC file are taken from the item being processed. The full form of the author's name is entered, and up to 10 authors will be listed.

Media Retrieval

Because FNIC indexes the items in its file more extensively than does the NAL Indexing Section, little use has been made by the FNIC of title enrichment--with the notable exception of audiovisual materials. The title of each piece in the center's educational media collection is enriched with the term or terms denoting its format, for example, USING STANDARDIZED RECIPES (FILM LOOP). These enrichment terms are extremely useful in retrieving particular types of teaching aids.

The following terms are used for title enrichment by indexers at the center:

Audiotape
Cartoon
Cassette Tape
Chart
Coloring Book
Crossword Puzzle
Film Loop
Filmstrip
Game
Kit
Model
Motion Picture
Phonodisc
Playing Cards
Poster
Record
Show 'N Tell
Slide
Study Print
Transparency
Videocassette

Each of these terms may also appear in its plural form, and some of the terms are more likely to appear in that form--for example, slides and transparencies. Because these terms are part of the title field, they are searchable as single-word entries; so in order to retrieve a particular type of media, one must use the same searching techniques that would be appropriate for searching other title words.

FNIC CATEGORY CODES, 1970-1978

1505 Consumer Education
Consumer economics, consumer protection, open dating of food

1510 Nutritional Science and Nutrition Education
Diets, food analysis, food and/or nutrition-related diseases or disorders, food habits, food science, health, malnutrition, nutritional surveys, general works on nutrition education

1520 History
Historical works tracing the history of food programs, general works on foods and the food service industry, food problems

1525 Food Standards and Legislation
Food grades, food standards, labeling, food and nutrition-related legislation

1530 Management and Administration computer applications, contracts, financial management, food service management, personnel management, marketing, food preference surveys, public relations

1535 Education and Training
Adult education, career education, curriculum, educational planning, educational programs, audiovisual aids, teaching techniques, personnel training, inservice education, vocational guidance

1540 Menu Planning
Cycle menu, menu design, meal management, automated menu planning

1545 Food preparation and Production
Quantity food preparation, food delivery systems, weights and measures, merchandising

1550 Equipment
Cooking equipment, cleaning equipment, facilities planning and design, waste disposal equipment, equipment standards, equipment storage

1555 Sanitation and Safety
Food sanitation, equipment sanitation, pest control, hygiene, safety, accident prevention, food borne illness

1560 Food Technology
Food packaging, food processing, food preservation, new products

1565 Programs (General)
International, national, state, and local programs; food programs; Federal programs

1570 Recipes
Cookery native to a specific country or locale, the art of cooking, recipes

1575 Reference Materials
Directories, dictionaries, statistical data, food composition tables, information science

1580 Purchasing, Receiving, and Storage
Care and handling of food, food selection, food storage food delivery, purchasing of food and equipment

Additional Codes during 1979:

1511 Nutrition and Health Education
Educational materials, teaching methods, textbooks, education programs

1512 Physiology of Human Nutrition
Digestion, metabolism, nutrition in the life cycle

1513 Diet and Diet-Related Diseases
Diet, malnutrition, special diets, weight control, diet therapy, food allergies, and other dietary disorders (for example diabetes)

1514 Food Composition
Food analysis and composition, food quality, nutrient tables

1516 Food Service Management
Quantity food service planning, training, equipment, administration; energy conservation; sanitation

1565 U.S. Nutrition Programs (Specific)
Child Nutrition, EFNEP; Food Stamp; Head Start; WIC; Title VI(elderly)

3. American Agricultural Economics Documentation Center (AAEDC) Records

The American Agricultural Economics Documentation Center (AAEDC) was established in 1970 through the cooperative efforts of the American Agricultural Economics Association, USDA's Economic Research Service, the Statistical Reporting Service, and the National Agricultural Library. The purpose of the center is to collect and document the literature of agricultural economics, thus gaining better bibliographic control. Dissemination of bibliographic information on agricultural economics is achieved through the center's database, AGECON (AGricultural ECONomics).

NAL's computerized bibliographic system has been used by the center since late 1970 for creation and storage of citations, but until 1976 those records were not made available on the sale tapes supplied by NAL to its subscribers.

In January 1976 all of the AGECON records (over 5,000 of them at the time) were added to the sale tape, and since that time, the records prepared by the AAEDC have been made available as part of the monthly AGRICOLA sales tapes. The AGECON file contains now over 15,000 citations and is increasing by approximately 200 references with each monthly update.

The information in the AGECON file was used to produce the American Bibliography of Agricultural Economics (ABAE) until it ceased publication in 1974. There was no regularly published product nor easy access to this file after the ABAE's demise until January 1976, when the retrospective file was made part of AGRICOLA. Beginning in April 1977, the AAEDC records for articles on agricultural economics (approximately 75 per cent of the records processed by the center) will be published in the Bibliography of Agriculture. The AGECON records have, since 1977, been assigned subject category codes from the existing NAL subject category code list, with most of the references appearing in the agricultural economics categories (1005 through 1030 for 1972-79 and E000 through E720 since 1980).

In 1977 a subfile AGECON called AGC (AGriculture Canada) was made part of the database. This subfile, containing citations relevant to Canadian agricultural cooperatives, is being prepared by the Cooperative Unit, Economics Branch, Agriculture Canada in cooperation with the Library of Agriculture, Canada. It is hoped that this project will be the prototype of a much expanded effort to cover comprehensively all Canadian agricultural economics literature.

Scope

Journal articles (see subscription list at the end of this part of the chapter); government documents; and publications from universities, experiment stations, and extension services are selected for inclusion in the AGECON file. Conference and symposium proceedings and other items judged to be of interest to agricultural economists are also included. The emphasis in this collection is the work done by the United States and Canadian agricultural economists or for organizations in the United States and Canada.

Selection Guidelines

The AAEDC has established guidelines regarding the format and content of items selected for inclusion in the AGECON file. These guidelines are outlined here.

A. Publications meeting requirements in the categories below will be included in AGECON.

1. All articles in major agricultural economics journals (AJAE, SJAE, NAEC Journal, WAEA Journal, CJAE, Canadian Farm Economics).

2. All materials published and/or authored by faculty and researchers at college and university agricultural economics departments. (Includes staff papers and other departmental series, regardless of whether formally reviewed.)

3. All journal articles and monographs authored by agricultural economists at state experiment stations and extension services.

4. Other items applicable to research needs of agricultural economists, for example:

   a. articles on economic models which are applicable to agriculture
   b. contributed papers at professional meetings
   c. substantive speeches relating research results or major issues, which are not ephemeral and appeal to a wide agricultural economics audience.

B. The following items will not be included in AGECON:

1. Speeches (except as in 4c above).

2. Material specified (in writing) to be for internal use only; for example, ERS working papers.

3. Popular publications, regardless of authorship, intended for use by the general public, for example, a leaflet describing USDA in general terms.

4. Statistical compilations covering less than a 1-year period.

5. News releases.

6. Items in trade publications promoting specific brands of agricultural equipment or products.

Indexing Practices

The AAEDC staff members maintain a controlled vocabulary which is used for indexing the items going into AGECON. Terms from this list are entered in the descriptor field of the unit records.

From 1970 until the end of 1976, AAEDC used its own set of category codes for assignment to references. (See the end of this section for an annotated listing.) Code numbers 1010, 1020, and 1030 duplicate codes used by NAL, but with slightly different scope. The searcher needs to exercise caution, therefore, when incorporating these codes into search strategies. Since January 1977, however, the AAEDC codes have been discontinued and AGECON records conform to the agricultural economics codes used by NAL.

Prior to 1977 the AAEDC staff used the full form of the author's name as it appeared on the publication as the form of entry in the bibliographic citation. Since 1977, NAL indexers have followed the practice of using last name and initials.

Finally, because of some unforseen problems with the use of old CAIN tapes unrelated to the creation of AGECON records, it was necessary to tag all of the pre-1977 AGECON records as monographs, even though more than 30 per cent of the items in the file are journal articles. Since the changes instituted in 1977, that problem has been solved, and new records are tagged properly.

Any questions regarding AGECON can be addressed to:

American Agricultural Economics
Documentation Center
Room 146, GHI Building
500 12th Street, S.W.
Washington, D.C. 20250
Telephone: (202)447-2474

Journal Subscriptions

American Journal of Agricultural Economics
Canadian Journal of Agricultural Economics
Food Research Institute Studies in Agricultural Economics, Trade, and Development
Journal of the American Society of Farm Managers and Rural Appraisers
Journal of Economic History
Journal of Forestry
Journal of Leisure Research
Journal of the Northeastern Agricultural Economics Council
Journal of Political Economy
Journal of Range Management
Journal of Regional Science
Journal of Soil and Water Conservation
Land Economics
Rural Sociology
Social Science Quarterly
Southern Economic Journal
Southern Journal of Agricultural Economics

AGECON CODES

1010 Agricultural Marketing

Input and output markets; market power, costs, and efficiency; industrial organization and market structure; policy on marketing regulations; prices and pricing; transportation; wholesaling and retailing; new products; bargaining; futures markets; market institutions; market orders; market boards; cooperatives.

1020 Agricultural Policies and Programs

Production adjustments and supply control; income augmentation; credit and finance; housing improvement; economic planning; food distribution programs; trade policy; land tenure; commercial agriculture; subsidized exports.

1030 Agricultural Products, Demand, Supply, and Prices

Demand, supply, and price; outlook projections and forecasting; input-output analysis of agriculture in the national economy; farm income; functional coordination; sector analysis; interregional competition.

1040 Food and Consumer Economics

Food situation--supply and needs; food expenditure and consumption; food cost and market spreads; food prices; away-from-home eating; consumption patterns, habits and preferences; nutrition.

1050 Foreign Development

Producer economics; marketing economics; internal policies; industrialization; agrarian reform; trade analysis; development planning; income distribution.

1060 Production Economics and Farm Management

Farm organization and managment; farm enterprises, practices, technology, and input combinations; farm finance and capital; agricultural risk and returns; structure of agriculture and economics of farm size; farm and land values and valuations; industrial inputs; organization and management; farm records and accounting.

1070 Regional and Human Development

Rural and farm population; migration; manpower training; industrial development; levels of living; local, county, and state governments; low-income areas and people, interregional and interindustrial structure; employment oportunities; regional economic development; area adjustments in the urban rural fringe; impact of urban growth on rural areas; rural sociology dealing with this category; public services; income sources and distribution.

1080 Resource Economics

Land utilization; land tenure; water utilization; watershed development; resource institutions--water rights and legislation, land use regulations, resource districts and

organizations; outdoor recreation; resource productivity and income distribution; resource use planning; incidence of benefits and costs; environmental quality; pollution.

1090 General

Economic theory, methodology, agricultural history, other topics.

4. Environmental Impact Statement Subfile

Beginning with the sale tapes for November 1978, a subfile consisting of draft and final environmental impact statements related to agriculture and natural resources was incorporated into AGRICOLA. By mid-1983 the subfile contained over 1625 records.

The citations are taken, through a working agreement with USDA, from EIS: Key to Environmental Impact Statements, published by Informaton Resources Press. A profile has been established for computerized determination of citations to be incorporated into the subfile. All USDA environmental impact statements will be included plus others selected on a subject or corporate source basis. The records added from EIS contain most of the data elements found in the published reference tool, including:

Author (almost exclusively corporate bodies)
Title
Date of publication
EIS accession number (augmented by NAL)
Pagination or number of volumes
Keywords (descriptors, geographics, and corporate added entries) as applied by EIS.

The abstracts and related narrative summaries of the documents are not available in this subfile, but the accession numbers will lead the user to relevant document summaries in the EIS published service. Accession nmber prefixes in this subfile have been changed from "EIS" to "NAL ENV," but number designations have remained the same. Accession numbers for draft impact statements are suffixed with a D.

Subfile records are augmented in two ways. First, each record contains instructions for obtaining the full impact statement. Second, NAL subject category codes are assigned to the records to

enhance their retrievability. These items have been tagged with the three-character label, ENV, so that the subfile can be searched as a separate part of the AGRICOLA database.

There has been no augmentation or changing of the basic data elements included in the EIS. Check system-specific sections of the manual for protocols required to search the controlled vocabulary fields of the unit records.

5. Brucellosis Subfile

The November 1978 AGRICOLA tape update marked the beginning of the Brucellosis subfile, which by 1983 contained just over 3,400 references to the world's literature about this disease which affects both livestock and man. It has been gathered and organized by the staff of the Cattle Disease Program of the Animal and Plant Health Inspection Service (APHIS). The subfile contains significant references to literature on monitoring, controlling, and eradicating the disease . Publications date from the late 19th century to the present. Coverage of post-1969 literature is, however, more comprehensive than works published earlier on this topic.

Materials selected for the subfile include both monographic works and serial publications. All aspects of brucellosis are included in the subject coverage of the file, including its etiology, epidemiology, pathology, treatment, prevention, and economic impact. References are to English language items or to English translations. A number of significant foreign language items with substantial abstracts or summaries in English are included as well.

All records in the Brucellosis subfile are tagged with the three-character label BRU so that, if desired by the user, this subfile can be searched as a separate entity within the AGRICOLA database. Brucellosis records are compatible in their searchable elements with other AGRICOLA records; that is, they may be searched by title, author, descriptor, and the like. A controlled vocabulary based on the Animal Disease Thesaurus and enriched with terms unique to this disease is used in assigning subject descriptors to records in this subfile. For information on the availability of this thesaurus, write to:

Technical Support, Veterinary Services
Animal and Plant Health Inspection Service, USDA
Room 756, Federal Center Building No. 1
Hyattsville, Maryland 20782

6. Energy in Agriculture Subfile

A subfile of well over 10,000 citations relating to energy in its relation to agriculture was added to AGRICOLA in 1980. It consists of the basic set of references collected and organized at Michigan State University by Dr. William Stout. Updates to the original bibliography have been contributed on a cooperative basis by NAL, Michigan State, and Texas A&M University Library.

While the early records vary somewhat from the usual format of AGRICOLA records, the recent additions conform to NAL formats. Personal names are treated in the manner typical of indexing records, that is, last name and initials. Materials in many languages are represented in the subfile, but the heavy majority of publications are in English. Through an agreement with Microfilming Corporation of America, many of the publications in the Energy in Agriculture subfile of AGRICOLA are available in a special microfiche collection. Records in this subject area are tagged either ENR (initial records) or ENE (newer records).

7. 4-H Publications Subfile

Beginning in 1980, and in cooperation with the Agricultural Extension Service, staff at Iowa State University began forwarding bibliographic information for Extension 4-H publications to the Cataloging Section of the National Agricultural Library for incorporation into AGRICOLA. Presently the file contains some 1,600 records for publications, principally from the states of the north-central region of the country. Materials to be found in the 4-H subfile range from handbooks on animal judging to project descriptions on container gardening. All are for use by 4-H participants or 4-H group leaders.

Records in this subfile contain the author's full name, a number of subject descriptors, and a one- or two-sentence annotation. Appropriate subject category codes have been added to the records as well. Records are tagged 4-H.

8. Adult Extension Subfile

In 1981 catalogers at NAL, in cooperation with the Extension Service, began to create machine-readable records for adult Extension publications. Assistance from Iowa State University in creating records for this file began in 1982. As with the 4-H subfile, the records in the Adult Extension Subfile emanate from the states of the north-central region (Kansas, Iowa, Indiana, Minnesota, Michigan, etc.) By 1983 the subfile contained nearly 5,000 records.

Names in the bibliographic records are drawn from the item itself and tend to vary in format; therefore, searching the last name plus full given names or initials is advisable. In addition, records contain a list of descriptors, subject category codes, and a brief annotation. Subfile records are tagged ADU.

9. Parasitology Subfile

The Index-Catalogue of Medical and Veterinary Zoology (ICMVZ), is a compendium of the world's literature on animal and human parasitology. Publication began in 1902 and has continued to the present. Over 160 catalogs comprising over 45,000 pages have been published by the U.S. Department of Agriculture. The Index-Catalogue is divided into five catalogs: Author, Parasite, Host, Subject Heading, and Treatment. Most of these publications are still available by requesting them free of charge from the ICMVZ, Animal Parasitology Institute, Building 1180 BARC-East, Beltsville, MD 20705. Future issues of the ICMVZ can be purchased from Oryx Press, 2214 North Central at Encanto, Phoenix, AZ 85004. For a complete history of the Index-Catalogue, see W.W. Becklund's article in the 1969 Journal of Parasitology, volume 55, number 2, pages 381-384.

The Index-Catalogue includes published literature from journals, proceedings, monographs, and similar literature on parasites, their taxonomy, hosts, body location, geographic distribution, treatment, and other general and experimental work. Coverage includes protozoa, helminths, and certain arthropods (ticks, mites, insects, copepods, isopods, linguatilids, and rhizocephalids). The information is also available in the cumulative card files (over 3 million entries) located at the Animal Parasitology Institute.

The Index-Catalogue became a subfile of AGRICOLA in 1983. The parasitology subfile (labelled PAR) includes over 9,000 records and grows on the average of 750 records per month or approximately 9,000 records per year. Records are searchable online by author, title, parasite name, subject term, AGRIS geographic code, and abstract.

E. CATEGORY CODES (1980-)

A000 AGRICULTURE

General consideration of agriculture in its wide sense, including fisheries, food, forestry, and veterinary science

General proceedings, annual reports, and acts of agricultural institutions, societies, and chambers of agriculture

For:

*specific concepts, use subjects as appropriate
*air, soil, and water pollution, use W000

Earlier Codes: (70-1) 05; (72-9) 0505
Strategy Considerations: Terminology of a more general nature (pesticides, farming, etc.) will provide better results with this code than will highly specific terms.

A500 RESEARCH

Use for works on research methods
Research plans, policies, programs, projects, methods
Research administration and financing
Research personnel
Laboratory equipment

For:

*research on specific subject matters, use subjects as appropriate
*experimental stations and farms in relation to education, use C000-C210
*experimental methods in:
animal nutrition, use L500
forestry research, useK000-K810
human nutrition, use T000-T300
plant protection, use F800-F841
soil chemistry and physics, use J200
veterinary science, use L800

Earlier Codes: (70-1) 05; (72-9) 0505
Strategy Considerations: These codes are most appropriately

applied to to very general methods papers or to works looking at general organization and administration of research programs. Use subject specific codes and terminology for desired methods for papers on research in particular fields.

B000 GEOGRAPHY, CLIMATE AND HISTORY

Earlier Codes: (70-1) 05; (72-9) 0505, 4005, 4010
Strategy Considerations: This general code is seldom used; prefer a more specific heading and appropriate terminology.

B100 Geography

Geographies, maps, atlases, travels applicable within the scope

For:

*climate and weather mapping, use B200
*forest mapping, use K250
*geography in relation to animal distribution, use L700
*names of geographical areas, see Geographic Codes
*physical geography in marine habitats, use M400
*physical geography in freshwater habitats, use M500
*physical geography in relation to climate and meteorology, use B200
*physical geography of site situations, use B200
*soil surveying and mapping, use J400
*water surveying and mapping, use P200

Earlier Codes: (70-1) 05: (72-9) 0505, 4005, 4010
Strategy Considerations: To retrieve items related to specific areas, combine code with appropriate geographic terms, including variant forms and implied geographic indicators (e.g. Mexico, Mexican, Saltillo, Sonora, Sonoran, etc.)

B200 Meteorology and Climatology

Air and atmosphere; agrometeorology, including weather forecasting; temperature

Barometric pressure; humidity and evaporation; precipitation

(excluding surface water aspects); induced rainfall

Agroclimatology, including bioclimate, microclimate, climatic influence, types, zones, and changes; hydroclimatology

Climate and weather mapping

Physical situation in relation to agriculture, latitude, and longitude, altitude, gradient, and aspect

Meteorological instrumentation and equipment

Forest meteorology and climatology, add K000 or K120

Effect of weather and climate on silviculture, add K120

Effect of weather and climate on forest fires, add K810

For:

*environmental biology, use F300
*environmental pollution, use W000
*plant hardiness, use F600
*plant injury by atmospheric factors, use F840
*solar radiation, use P100-P140
*surface water hydrology, use P200
*weathering in relation to soils, use J300
*wind and rain in relation to soil erosion, use J800

Earlier Codes: (70-1) 05; (72-9) 0505
Strategy Considerations: For earlier works, rely on word strategy.

B500 History

Use for works on history and biography; add specific subjects as secondary categories

History of agriculture, fisheries, food, forestry, veterinary science, etc.

Earlier Codes: (70-1) 05, 75: (72-9) 0505, 1005, 1090, 1520, 3505, 4005, 9505
Strategy Considerations: Earlier codes covered history as aspects of general categories for particular fields such as

plant science, etc.

C000 EDUCATION, EXTENSION, AND ADVISORY WORK

Earlier Codes: (70-1) 05, 10, 75; (72-9) 0505, 1070 (AGECON to 1977), 1511 (FNIC 1979), 1535, 3505, 4005, 5505, 9505
Strategy Considerations: Earlier codes are very general or are specific to education in narrower fields; double indexing was seldom used for this concept. Use word strategy in conjunction with codes.

C100 Education and training (not extension)

(add specific subjects as secondary categories)

Teaching, demonstration, training (other than extension) in agriculture, fisheries, and forestry

Education plans, policies and programs

Education and training institutions, personnel and equipment including experiment stations and experimental and model farms other than extension services

Agricultural journalism and publishing

Public relations activities

For:

*nutrition education, use T100
*trade promotion, use E700

Earlier Codes: (70-1) 05, 10, 75; (72-9) 0505, 1005, 1070 (AGECON to 1977), 2505, 3505, 4005, 5505, 95055
Strategy Considerations: Earlier codes are very general or are specific to education in narrower fields; double indexing was seldom used for this concept. Use word strategy in conjunction with codes.

C200 Extension and advisory work (non-US)

(add specific subjects as secondary categories)

Advisory and information services for farmers, rural residents, home economics

Education of services, training of leaders, etc.

Nutrition extension, add T100

Community services and planning extension, add E560

Farm management extension, add E200

Livestock production extension, add L000

Crop production extension, add F000

etc.

Earlier Codes: (70-1) 05, 10, 75: (72-9) 0505, 1005, 1070 (AGECON to 1977), 3505, 4005, 5505, 9505
Strategy Considerations: Earlier codes are very general or are specific to extension work in narrower fields; double indexing was seldom used for this concept. Use word strategy in conjunction with codes.

C210 U.S. extension services

(add specific subjects as secondary categories)

(State extension service publications, use the specific subject category combined with document source code for extension publications [tape source code 3], add C210 only when the subject of the item is extension service)

Extension services in U.S. agriculture, fisheries, forestry and home economics

Extension plans, policies, and programs of U. S. and individual states

Education and training institutions, personnel and equipment,

including experimental station and experimental and model farms in the U.S. used for extension work

Training of personnel for extension work

Information about 4-H programs in publications other than 4-H

Evaluation of U.S. extension services

Nutrition extension, add T100

Community services and planning extension, add E550

Farm management extension, add E200

Livestock production extension, add L000

Crop production extension, add F000

etc.

For:

*4-H extension publications, see also AGRICOLA 4-H subfile

Earlier Codes: (70-1) 05; (72-9) 0505, 1005 (NAL)

D000 ADMINISTRATION AND LEGISLATION

Earlier Codes: (70-1) 05; (72-9) 1010 (NAL), 1030 (NAL), 1060 (AGECON to 1977)
Strategy Considerations: Many of the items for which this code is appropriate will be retrieved most easily by a strategy containing fairly broad, general terminology.

D100 Administration

Use for works on administration; add specific subjects as second categories

Organization and public administration of general agriculture at local, central, national, and international levels

Organization and management of cooperatives, add E400

National and international organizations

For:

*development aims, policies programs, use E300
*U.S. food and nutrition programs, use E310
*research administration, use A500
*fisheries management, use M200-M220
*forest management, use K200

Earlier Codes: (70-1) 05; (72-9) 1010 (NAL), 1060 (AGECON to 1977)
Strategy Considerations: Many of the items for which this code is appropriate will be retrieved most easily by a strategy containing fairly broad, general terminology.

D500 Legislation

Environmental laws and regulations. (OSHA standards, EPA emission and water effluent regulations, etc.) Legislation intended to control and monitor environmental quality

Use for laws, statutes, regulations, etc., and for works on legislation; add specific subjects as second categories

Local, national, international legislation in agriculture, fisheries, food, forestry, veterinary science, etc.

Import and export regulations

Customs regulations

Legislative aspects of quality control: inspection, supervision, labelling; sanitary regulations (double index food to Q200, feed to R200, forest products to K500-K540, nonfood products to S000-S200)

Animal quarantine regulations (double index to F800)

Legislation on breeders'rights; registration and patents of plant varieties (double index to F200), animal breeds (double index to L200)

For:

*feed quality, use R300
*food quality, use Q500
*veterinary hygiene, use L800
*water right, use P200

Earlier Codes: (70-1) 05; (72-9) 1030 (NAL)
Strategy Considerations: Be sure to include general as well as specific terms in the strategy in order to achieve the most satisfactory results.

E000 ECONOMICS, DEVELOPMENT, AND RURAL SOCIOLOGY

Economics associations, general textbooks, conferences, research, etc.

Specific concepts go with subject

Economics education and extension, add C000-C210

Earlier Codes: (70-1) 10; (72-9) 0505, 1005 (NAL), 1090 (AGECON to 1977)

E100 Economics

Macro-economics (systems dealing with masses or aggregates); national, regional and international agricultural policies, programs, and relations with industry

Economic analysis; economic forecasting; economic appraisal

Agricultural situation and outlook

Economic planning, financing, and accounting, credit policy, taxation, investment

Labor (macro-economics): manpower and labor demands; work: employment, unemployment, pay, income; economic aspects of migratory or contract labor

Economic models, statistical methods, econometrics, add X100

For:

*agricultural enterprises, agricultural industry, use E130
*economic policies of farming, use E200
*economics of agricultural production at the farm level, use E200
*farm organization and management, use E200
*feed industry, use R100
*fisheries economic polcies, use M200-M220
*fisheries organization and management, use M200-M220
*forestry economic policies, use K200
*forestry organization and management, use K200
*marketing and distribution, use E700
*marketing cooperatives, use E700 and E400
*planning and development of food industries, use Q100
*population and food supply, use E300
*productive capacity of agriculture, control of production, production goals, surplus situation, use E130
*research financing, use A500

Earlier Codes: (70-1) 10; (72-9) 1005 (NAL), 1030 (AGECON to 1977 and NAL)

E110 Land economics

Economics of land development, land reform, and utilization; land capability; land classification; land surveys; land valuation; zoning

Location theory, regional planning, land aspects of town and country planning, land distribution, land policy

Ownership and tenure

Agrarian structure, farm sizes and numbers

For:

*conservation and restoration of natural environment, use P300
*recreational use of farm or forest land, use P300
*soil resources and management, use J600
*soil capability, use J600
*soil classification and genesis, use J300
*soil surveys and mapping, use J400

*social aspects of town and country planning, use E550
*water resources and management, use P200

Earlier Codes: (70-1) 10; (72-9) 1005 (NAL), 1030 (NAL), 1080 (AGECON to 1977)

E130 Economics of agricultural production

(Code added January 1, 1982; earlier, consider searching E100)

(add specific commodity as secondary category)

Agricultural enterprises, agricultural industry

Agricultural inputs and outputs

Production policies and programs

Productive capacity of agriculture, control of production

Productive goals, yields, surplus

For:

*economics of production at the farm (micro) level, use E200
*production in less developed countries, use E300

Earlier Codes: (70-1) 10; (72-9) 1010 (NAL), 1015 (NAL), 1060 (AGECON to 1977); (80-1) E100

E200 Farm organization and management

Micro-economics (systems dealing with individuals or small enterprises); farm level production economics

Systems of farming: private, collective, state farms, contract farming, cooperative farming, corporation farming, tenant farming: cash tenancy, share tenancy, etc.

Agribusiness, vertical and horizontal integration of farming

Farm structure and layout

Organization, operation, and administration of farm resources

Economic policies, planning, and development at the farm level; taxation, subsidies, credits, crop loss and other farm insurances

Costs and returns of farm operations; pesticide, fertilizer and equipment costs as they relate to production, otherwise in H000, J500, or N200

Land as a cost input, add E110

Farm administration: budgeting, bookkeeping, accounting, integration; cost factors: capital, materials, labor

Labor organization and management (micro-economics): manpower and employment of farms; wages and systems of remuneration; productivity, efficiency, and work study, production systems, production cooperatives

Farm models, add I100

For:

*agricultural enterprises, agricultural industry in general, use E100
*agricultural inputs and outputs, use E130
*cultivation systems, use J700
*fisheries organization and management, use M000
*forestry organization and management, use K200
*legislation in agriculture, including taxation, etc., use D500
*marketing cooperatives, use E700 and E400
*model farms, use C000-C210

Earlier Codes: (70-1) 10; (72-9) 1010 (NAL), 1015 (NAL), 1060(AGECON to1977)

E300 International development aid, aims, policies, programs

International food situation and outlook

World population and world food supply issues (food shortages, food requirements, food stock situations), food supply programs in developing countries and poverty areas

Development aid; agricultural relief and reconstruction; technical assistance programs

Food aspects of welfare programs

For:

*rural development, use E550
*economic policies, planning, and development of the farm, use E200
*economic policies, planning, and development of fisheries, use M200-M220
*economic policies, planning, and development of forestry, use K200
*development of food industries, use Q100
*development of feed industries, use R100
*food production in developed countries, use E130
*land development, use E110
*water resources development, use P200
*U.S. food and nutrition programs, use E310

Earlier Codes: (70-1) 10; (72-9) 1030 (NAL), 1050 (AGECON to 1977)
Strategy Considerations: For specific countries and regions be sure to include variant names.

E310 U.S. food and nutrition programs

Food stamps, EFNEP, Meals on Wheels, Title VII (elderly), special supplemental foods, summer program, child care, milk programs, school lunch, school breakfast, commodity foods programs, N.E.T. (not nutritional education aspects), food safety and quality programs

Program administration: policy, implementation of relations, program impact and evaluation, community involvement

Legislation, add D500

For:

*nutrition education aspects, use T100

Earlier Codes: (70-1) 10; (72-9) 1030 (NAL), 1070 (AGECON to 1977), 1565 (FNIC)

E400 Cooperatives

(add specific subject as secondary category)

Organization and administration of cooperatives, add D100

Marketing cooperatives, add E700

Consumer buying cooperatives, add E720

Rural housing cooperatives, add E560

Production, financial, credit union, insurance, service Cooperatives, etc., add E200

Effect of cooperatives on agricultural economics, add E100

Earlier Codes: (70-1) 05; (72-9) 0505, 1010 (AGECON to 1977)

E500 Rural sociology

Sociology and sociography of rural populations, communities, and institutions

Social adjustments settlement, migration, industrialization, urbanization

Rural-urban relations, village studies

Social change, social aspects of agrarian reform

Demography, social structure, social stratification

Sociology of the farm family and other aspects of rural life and living conditions

Cultural factors, impact of new cultural trends and technology on rural environment, adoption of innovations, conflict, leadership, human ecology

Conflict and political movements

Social aspects of communication and leisure activities

For:

*economic aspects of migratory or contract labor, use E100
*ethnobotany, use F000
*rural community services, use E560
*household equipment, housekeeping, home child-care, use U000
*social aspects of feeding, use T000

Earlier Codes: (70-1) 10; (72-9) 0505

E550 Rural development

Programs, policies and planning for rural development

Rural industry and business, employment and unemployment, standard of living

Rural economy other than farm economy, employment of landless labor

Rural aspects of town and country planning

For:

*labor organization and management on the farm, use E200
*rural marketing, use E700
*land aspects of town and country planning, use E110
*development assistance for developing countries and poverty areas, use E300
*agricultural economic development, use E100

Earlier Codes: (70-1) 10; (72-9) 0505, 1030 (NAL), 1070 (AGECON to 1977)

E560 Rural community services (added January 1, 1981)

Planning, financing and implementing public services in rural communities

Rural health conditions, health services, health facilities and

personnel

Rural social services, social welfare, pensions, care of elderly, day care centers, etc.

Public utilities for rural areas, transportation systems, sanitary systems, water supply systems, etc.

Rural community institutions, schools, churches, recreation centers, etc.

Policies, programs, and planning for rural housing

For:

*public health (other than rural), use X380
*housing construction, use N100
*rural electrification, use P100 or P140
*construction of rural roads, use N100
*safety devices, use N000

Earlier Codes: (70-1) 10; (72-9) 0505, 1030 (NAL), 1070 (AGECON to 1977)

E700 Distribution and marketing

Commerce and trade in products or agriculture, fisheries, and forestry at domestic, national, and international levels

Supply and demand; market research, forecasting, etc.

Trade agreements (commodity agreements) and tariffs, balance of trade and payments

Price fixing and maintenance

Distribution policies, costs, and methods; transportation of agricultural, forestry, fisheries products

Merchandising: wholesale and retail selling, auctioning and other methods of selling; marketing cooperatives

Trade promotion: advertising and propaganda

Econometric models of market structure, statistical analysis of

markets, add X100

Distribution and marketing of processed foods (double index to Q000) and feeds (double index to R000)

Costs and returns of marketing as a part of farm operations, add E200

Import and export regulations, add D500

For:

*customs regulations, use D500
*distribution and marketing from the consumer point of view, use E720
*food packaging, use Q300
*food processing, use Q100

Earlier Codes: (70-1) 10; (72-9) 1010 (AGECON to 1977), 1015 (NAL), 1020 (NAL), 1030 (AGECON to 1977)

E710 Grading, standards, labelling

add specific subject as secondary categories (Q500 for food grades, R300 for feed grades, S000-S200 for nonfood grades, K500-K590 for forest products grades)

Grading: classification of products by standards of uniformity, size, freedom from blemish or disease, fineness, quality, etc.

Content labelling

Legislative aspects of labelling, add D500

For:

*nutrition standards and labelling, use T300

Earlier Codes: (70-1) 10; (72-9) 1505 (NAL), 1525 (FNIC), 2035, 3520

E720 Consumer economics

Consumer movements

Consumer purchasing, power, credit, expenditures, disposable income, etc.

Consumer price index

Consumer demand systems

Buying habits and preferences

Consumer use of food and merchandise discount coupons

Pick-your-own produce from the consumer point of view

Consumer buying cooperatives, add E400

Earlier Codes: (70-1) 10; (72-9)1505 (NAL & FNIC)

F000 PLANT SCIENCE

General plant science or botany as it relates to agriculture

Associations, botanical explorations, ethnobotany

Includes fungi, yeasts, algae, bacteria, photosynthetic microorganisms

Earlier Codes: (70-1) 70; (72-9) 4005

F100 Plant production - general

General crop husbandry, crop forecasting

Propagation: grafting, budding, sowing, dividing, layering, cutting, transplanting, rejuvenation

Seed production including harvesting, cleaning, storage, cultivation, seed trials

Care of plants: pruning, crown thinning; planting, planting methods, nursery practice, cultivation under cover: greenhouse, hot house, under transparent film, etc.

Control of plant growth: acceleration, forcing by cultivation under cover; retardation, inhibition, flowering, artificial promotion of flowering by chemical means, hot water treatment, etc., ripening, maturing, artificial ripening

Yields; harvesting and handling of crops

For:

*specific crops, use appropriate category F110-F140
*breeding for plant disease control, use F830-F833 and F200
*breeding for plant pest control, use F820-F822 and F200
*culture of micro-organisms, use specific subject: soil, J100; food processing, Q120; food contamination, Q200,; etc.
*distribution and marketing of agricultural products, use E700
*farm management, use e200
*forest seed production, use K120
*greenhouse structures, use N100
*landscape management, use P300
*legislative aspects of quality control of agricultural products, use D500
*shade tree production, use K120
*plant breeding, introduction, selection, use F200
*plant physiology, use F600
*production of aquatic plants, use M130
*production of forest trees, use K100, K110 or K120
*systems of soil cultivation, use J700
*transportation of agricultural products, use E700

Earlier Codes: (70-1) 70; (72-9) 4050, 4055, 4060
Strategy Considerations: Works treating a large number of plants may be indexed here rather than under codes for specific types of plants; consider including this code when the goal is complete coverage.

F110 Plant production - horticulturalcrops

Horticulture and gardening: cultivation of gardens and orchards, including the growing of vegetables, fruit culture, viticulture,

lawn management, ornamental plants

Includes nuts, potatoes, olives, cassava

Includes harvesting of wild berries, nuts, mushrooms

Includes all cultural activities indicated under F100, but specifically for horticultural crops

For:

*crops grown for forage, use F120
*landscape management, use P300

Earlier Codes: (70-1) 70; (72-9) 4055

F120 Plant production - field crops

Field crops production; forage crops production other than pastures and range

Grain, edible oil, fiber, sugar, tobacco, peanut, soybean, and other field crops

Includes sunflower, cotton, flax, pigeonpeas, moth, and mung, mungo, broadbeans, horsebeans, cowpeas, jackbeans

Earlier Codes: (70-1) 70; (72-9) 4050

F130 Plant production - range

Pastures and range management: When a part of forest operations, add K001 as secondary category; when a part of grazing operations, add L500 as secondary category

Earlier Codes: (70-1) 70; (72-9) 4050

F140 Plant production - miscellaneous crops

Miscellaneous crops production: beverage, drug, flavoring, rubber, essential oil, industrial oil plants, bamboo, etc.

For:

*aquatic plant production, use M130

Earlier Codes: (70-1) 70; (72-9) 4060

F200 Plant breeding

Strains and cultivars of plants

Plant collecting, introduction, and selection; germplasm banks

Genetics, genetic evaluation; cytogenetics; heredity; variation

Breeding methods, techniques, and programs: crossbreeding, hybridization, induced mutation, etc.

Breeding and genetics, add K001

Aquatic plant breeding, add M001

Breeding for plant disease control, add F830-F833

Breeding for plant pest and disease control, add F800

Legislative aspects of breeders' rights, add D500

For:

*hereditary disorders, use F840
*pollination, use F600
*physiology of plant reproduction, use F600

Earlier Codes: (70-1) 70; (72-9) 4025

F300 Plant ecology

Plants in relation to their natural environment: ecology, phenology, environmental biology, external influences on biological processes in plants; indicator plants

Forest ecology, add K001

For:

*applications in rhizosphere, use J100
*aquatic plant ecology, use M320
*conservation of plants and vegetation, plant wildlife management, botanical gardens, use P000
*national parks, use P300
*natural distribution, plant taxonomy, use F700
*plant hardiness, use F600

Earlier Codes: (70-1) 70; (72-9) 4015

F400 Plant structure

Anatomy, cytology, histology, ultrastructure, and morphology of plants, including forest trees (double index to K001), aquatic plants (double index to M001) and weeds

Wood structure, add second category K510

Plant habit

Earlier Codes: (70-1) 70; (72-9) 4020

F500 Plant nutrition

Nutrition requirements of plants (trees, double index to K001), aquatic plants (double index to M001), foliar diagnosis, effect of nutrients on growth and development, absorption and assimilation of nutrients

Mycorrhiza, rhizobia and other microorganisms as related to plant nutrition

For:

*nutritional disorders of plants, use F840

Earlier Codes: (70-1) 70; (72-9) 4030, 4035, 4040, 4045
Strategy Considerations: Earlier codes were broader; add appropriate terminology to focus on nutritional aspects.

F600 Plant physiology and biochemistry

Physiology and biochemistry of plants, including forest trees (double index to K001), aquatic plants (double index to M0010, weeds: metabolism, transpiration, evaporation, plant relations, water loss, water requirement; respiration, photosynthesis, physiological aspects of symbiosis

Development, growth, reproduction

Chemical analysis of plants

Pollination by insects, add L001 (entomology related) or L002 (apiculture related)

Plant hardiness, resistance to extreme conditions

For:

*control of plant growth, use F100
*effects of environment on biological processes, use F300
*immunity; plant resistance to infection, use F830
*immunity; plant resistance to pests, use F820

Earlier Codes: (70-1) 70; (72-9) 4030, 4035, 4040, 4045
Strategy Considerations: 1972-79 codes were specific to crop type, so all should be used when the desired result is for physiology and biochemistry of plants in general.

F700 Plant taxonomy and geography

Classification, identification, nomenclature, and phyogeny or evolution of plants, including forest trees (double index to K001), aquatic plants (double index to M001), and weeds

Natural distribution of plants; flora; plant checklists

Paleobotany (except ecological aspects)

For:

*aquatic plant ecology, use M400
*terrestrial plant ecology, use F300
*plant genetics, use F200
*plant variation, use F200
*soil flora, use J100

Earlier Codes: (70-1) 70; (72-9) 4010

F800 PROTECTION OF PLANTS

General consideration of factors injurious to plants and measures for their control or alleviation

Experimental methods for diseases and pests in general; laboratory tests, field trials, etc.

Plant protection materials, equipment, methods and programs for disease and pest control in general

Plant protection services and organizations

Plant quarantine regulations, add D500

For:

*general considerations on factors injurious to trees, use K800

Earlier Codes: (70-1)7 70; (72-9) 4520
Strategy Considerations: Earlier codes were broader in scope, so focus results by adding appropriate terminology.

F820 Pests of plants - general and miscellaneous

Animals (other than insects and nematodes) injurious to plants and aquatic plants (double index to M001) and the damage they cause

Animals (other than insects and nematodes) as vectors of plant pathogens

Biology of pests

Pest surveys

Pest control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated and biological control); breedng for plant pest control (double index to F200)

Immunity; plant resistance to pests, pest resistance to pesticides

General material on all pests of a plant or plants

For:

*pesticides in general, use H000
*pests of stored products, use F850
*plant quarantine regulations, use D500 and F800
*wildlife injurious to trees, use K800

Earlier Codes: (70-1) 70; (72-9) 4520

F821 Pests of plants - insects

Insects, mites, and other arthropod pests injurious to plants, including forest trees(double index to K001) and aquatic plants (double index to M001) and the damage they cause

Insects, mites and other arthropod pests as vectors of plant pathogens

Biology of pests

Pest surveys

Pest control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for plant pest control (double index to F200)

Immunity; plant resistance to pests, pest resistance to pesticides

For:

*insect pests of stored products, use F851

Earlier Codes: (70-1) 70; (72-9) 4530, 4535, 4540, 4545
Strategy Considerations: 1972-1979 codes were specific to crop type, so all should be used when the desired results are for insect pests of plants in general.

F822 Pests of plants - nematodes

Nematodes injurious to plants including forest trees (double index to K001) and aquatic plants (double index to M001) and the damage they cause

Nematodes as vectors of plant pathogens

Biology of pests

Pest surveys

Pest control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for plant pest control (double index to F200)

Immunity; plant resistance to pests, pest resistance to pesticides

Earlier Codes: (70-1) 70; (72-9) 4520
Strategy Considerations: Earlier codes are not specific to nematodes; include appropriate words in strategy to focus results.

F830 Plant diseases - general

Plant pathology, including diseases of forest trees (double index to K001) and aquatic plants (double index to M001) and the causal organisms

Materials, equipment, methods, and programs for plant disease control (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for plant disease

control (double index to F200)

Disease surveys

Immunity; plant resistance to infection

For:

*insects as vectors of plant pathogens, use F821 and appropriate disease category
*deficiency diseases, use F840
*infections of stored products, use F850 and appropriate disease category
*food spoilage, use Q200
*pesticides in general, use H000
*physiological disorders of plants, use F840
*plant quarantine regulations, use D500 and F800
*plant injuries and toxicities, use F841

Earlier Codes: (70-1) 70; (72-9) 4520

F831 Plant diseases - fungal

Fungal disease of plants, including forest trees (double index to K001) and aquatic plants (double index to M001) and the causal organisms

Materials, equipment, methods, and programs for plant disease control (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for plant disease control (double index to F200)

Disease surveys

Immunity; plant resistance to infection

Wood destroying fungi, add K510

Earlier Codes: (70-1) 70; (72-9)4505

F832 Plant diseases - bacterial

Bacterial and mycoplasmal disease of plants, including forest trees (double index to K001) and aquatic plants (double index to M001) and the causal organisms

Materials, equipment, methods, and programs for plant disease control (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for plant disease control (double index to F200)

Disease surveys

Immunity; plant resistance to infection

Earlier Codes: (70-1) 70; (72-9) 4510

F833 Plant diseases - viral

Viral diseases of plants, including forest trees (double index to K001) and aquatic plants (double index to M001) and the causal organisms, viroids

Materials, equipment, methods, and programs for plant disease control (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for plant disease control (double index to F200)

Disease surveys

Immunity; plant resistance to infection

Earlier Codes: (70-1) 70; (72-9) 4515

F840 Plant diseases - physiological

Physiological and nutritional disorders, deficiency diseases; their prevention and control (double index forest trees to K001, aquatic plants to M001)

Hereditary disorders in plants including forest trees (double index to K001) and aquatic plants (double index to M001)

For:

*microbial plant disease, use F830-F833
*plant diseases caused by pests, use F820-F822
*plant hardiness, use F600
*plant quarantine regulations, use D500 and F800

Earlier Codes: (70-1) 70; (72-9) 4520
Strategy Considerations: Earlier codes not specific to physiological disorders; use appropriate terminology to focus results.

F841 Miscellaneous plant disorders

Injuries caused by atmospheric factors, fire, equipment, and other physical or non-biogenic agencies; their prevention and control

Phytotoxicity Injuries and toxicities of aquatic plants, add M001

For:

*forest injuries and protection, (including acid rain), use K800
*injuries to stored products, use F850
*forest fire management, use K810

Earlier Codes: (70-1) 70; (72-9) 4520
Strategy Considerations: Earlier codes included other aspects as well; use appropriate terminology to focus results.

F850 Protection of plant products - general and miscellaneous

Pests (except insects) and disease organisms injurious to stored or other products of plant origin; their occurrence and control

Storage injury caused by disease in the field, double index to specific disease category

Injuries to stored or other plant products caused by atmospheric factors, fire, equipment, and other physical or non-biogenic agencies

Rodent control measures

Includes foods of largely plant origin

Legislative aspects of protection of stored products, add D500

Protection of wood products (excepting insects), add K500-K590

For:

*feed spoilage, use R200
*food spoilage, use Q200
*home food storage, use U000
*methods of preservation and storage of feeds, use R100
*methods of storage of foodstuffs and processed foods, use Q110

Earlier Codes: (70-1) 70; (72-9) 2005, 2025, 2030, 2035
Strategy Considerations: 1972-79 codes were specific to classes of agricultural products and included processing and composition. For best results include appropriate terminology.

F851 Protection of plant products - insects

Insects (or other arthropod pests) injurious to stored or other products of plant origin; their occurrence and control

Insect pests of wood products, add K500-K590

Legislative aspects of protection of stored products for insects, add D500

Earlier Codes: (70-1) 70; (72-9) 4550

F900 Weeds

Weeds, including forest (double index to K001) and aquatic weeds (double index to M001), and parasitic higher plants; their deleterious effects and control, their occurrence and distribution

Plants poisonous to man

Herbicides; methods and equipment for their use

For:

*culture and harvesting of seaweeds, use M130
*physiology and biochemistry of weeds, use F600
*plants toxic to animals, use L810
*toxicity of herbicides to animals, use L841 and H000
*toxicity of herbicides to crops, use F841 and H000
*weed structure and morphology, use F400

Earlier Codes: (70-1) 70; (72-79) 4525

H000 PESTICIDES -GENERAL

Items which mention pesticides but no specific host, insect pest, pathogen, or weed

General consideration of pesticides (insecticides, acaricides, herbicides, nematicides, molluscicides, rodenticides, bactericides, fungicides, etc.), including preventive and curative systems, toxicology, pesticide dosage, persistence of pesticide effect, residues

Industry, technology, prices

Toxicity and other side effects of pesticides to man, birds, wildlife, fish, beneficial organisms, etc.

Toxicity to honeybees, add L002; toxicity to other beneficial insects, add L001

Food toxicology, add Q200

Phytotoxicity of pesticides, add F841

Pollutants, environmental pollution, add W000

Soil disinfection, add J100

Toxic residue regulations, add D500

Toxicity of pesticides to animals, add L810 (since 1983)

Effect of soil chemistry and physics on pesticide residues, add J200

Earlier Codes: (70-1) 60; (72-9) 4560

J000 SOIL SCIENCE

General aspects of soils

Forest soils, add K001

For:

*soil conservation, use J800
*soil cultivation, use J700
*soil resources, use J600

J100 Soil biology

Soil fauna (excluding pests) and flora (excluding soil-borne plant pathogens); soil-plant-animal relationships

Soil insects, add L001

Soil bacteriology and microbiology: ammonification, nitrification, denitrification, nitrogen fixation, decomposition of non-nitrogenous compounds, conversion of inorganic substances

Mycorrhiza, rhizobia, etc. when plant symbiont is not mentioned

Sterilization, soil hygiene, soil disinfection

Rhizosphere

Soil biochemistry

Decomposition of litter

Biology of forest soils, add K001

For:

*plant pests in soil, use F820-F822
*plant symbiont relation to nutrition, use F500
*soil-borne plant pathogens, use F830-F833

Earlier Codes: (70-1) 80; (72-9) 6005
Strategy Considerations: Earlier codes also included the physics and chemistry of soils; use appropriate terminology to focus search results.

J200 Soil chemistry and physics

Soil chemistry: organic and inorganic chemistry of soils (but not biochemistry); chemical properties: nutrient exchange, humus, etc.

Soil physics; physical properties: aeration, texture, etc., soil moisture content and water-retaining capacity, soil solution, permeability, absorption and adsorption, capillarity, infiltration, leaching; electrical and other physical aspects in relation to soils

Soil analysis; experimental techniques, field experiments; soil evaluation

Soil mechanics and structure, including structural condition and stability, porosity, degradation, regeneration

Soil engineering

Forest soils, add K001

Soil properties and pesticide residues, add H000

For:

*applications in irrigation requirements, use P210
*biochemistry of soils, use J100
*classification of soils, use J300
*soil erosion, use J800
*soil fertility, use J500

Earlier Codes: (70-1) 80; (72-9) 6005
Strategy Considerations: Earlier codes also included soil biology; use appropriate terminology to focus search results.

J300 Soil classification and genesis

Spatial distribution of soils; genetic (zonal) and textural classifications

Soil profiles; horizons and soil depth

Soil formation; weathering, transported soils, age of soils

Geological and mineralogical considerations in relation to soils

Earlier Codes: (70-1) 80; (72-9) 6005
Strategy Considerations: Earlier codes also included soil chemistry, physics and biology; use appropriate terminology to focus search results.

J400 Soil surveying and mapping

Soil surveying and cartography; methods and results of soil surveys

For:

*forest mapping and surveying, use K250
*geographical maps, use B100
*surveys of land use and capabilities, use E110
*surveys of soil resources, use J600
*water surveying and mapping, use P200

Earlier Codes: (70-1) 80; (72-9) 6005
Strategy Considerations: Earlier codes also included soil chemistry, physics, and biology; use appropriate terminology to focus search results.

J500 Soil fertility: fertilizers

Determination of soil fertility

Soil depletion, exhaustion, and toxicity; salinity and desalination

Fertilizer and manurial requirements; application of fertilizers and manures

Application of bacterial fertilizers, add J100

Composition, properties and compatibility of fertilizers and manures

Constitution and form of fertilizers and manures: solid, powder, granular, liquid; storage

Utilization of industrial waste, sewage, sludge as fertilizers; liquid waste disposal on farm land

Physical improvement of soils; soil conditioners

Fertility and fertilization of forest soils, add K001

Fertilizer industry, technology, statistics, prices and trade

For:

*biological input to soil fertility, use J100
*mineral deficiencies in plants, use F840
*fertilization of water for aquaculture, use M120-M130
*plant nutrition, use F500
*soil analysis, use J20
*soil chemistry and physics, use J200
*soil conservation, use J800
*soil cultivation, use J700
*soil sterilization, use J100

Earlier Codes: (70-1) 80; (72-9) 6010

J600 Soil resources and management

Resource potentialities of soils; surveys

Soil resources planning and development

Earth moving

For:

*economics of land development, use E110

*improvement of soil fertility, use J500
*landscape management, landscape and scenery preservation, use P300
*losses of soil, soil conservation, use J800
*soil and land reclamation, use J800
*soil cultivation, use J700
*soil science in general, use J000
*water resources and management, use P200

Earlier Codes: (70-1) 80; (72-9) 6015

J700 Soil cultivation

Tillage, harrowing, rolling, ploughing, fallowing, mulching, no till

Crop rotation

Intensive cultivation; monoculture

Intercropping, multiple cropping, catch cropping, exhaustive cropping, swidden agriculture

Soil management in pastoral systems

Dry farming; tropical, desert, arid-zone farming

Systems of cultivation under irrigation

Special methods of cultivation: electricity, artificial light, heat, soil warming, etc.; hydroponics, aeroponics, sand cultures

Tillage of forest soils, add K001

For:

*soil conservation, use J800
*soil improvement, use J500
*weed control, use F900
*tillage equipment, use N200

Earlier Codes: (70-1) 80; (72-9) 6015

J800 Soil erosion and reclamation

Coastal and inland movements and losses of soil; erosion by water or wind

Soil conservation; control of erosion by agricultural practices, soil or land fixation, shelterbelts and other methods

Soil and land reclamation

For:

*drainage and maintenance of water channels, use P210
*forest shelterbelts and windbreaks, use K100 or double index
*leaching, use J200

Earlier Codes: (70-1) 80; (72-9) 6015
Strategy Considerations: Earlier codes include other aspects of soil management; use appropriate terminology to focus search results.

K000 FORESTRY

Forests in general, including forest influence: the effect upon water, soil, climate, and health resulting from the presence of forests (double index to the appropriate second category)

Forestry associations, social and economic aspects of forestry as a whole; techniques and methods of forestry research. Specific research goes with subject

For:

*forest environment conservation, use P300 and K001
*forest ecology, use F300 and K001
*game hunting and sport fishing, use P000 (add K001 only when it is forestry related)
*recreational use of forest land, use P300 and K001

Earlier Codes: (70-1) 45; (72-9) 3505

K001 Forestry related (1981-)

Used as a second or third category to indicate that the preceding category is forestry related (Use of this code can be eliminated later if the commodity codes or controlled vocabulary are added to the system)

Earlier Codes: Previously indexed to Old Code 45 or to 72-79 codes 3505-3520
Strategy Considerations: This code is now frequently used as a secondary code when the forest environment is significant in relation to another topic, e.g. entomology or soils. It should prove a convenient method of focusing a search to forest settings without a lengthy word search. Note, however, the code has been used only since 1981.

K100 Forestry production - general

Silviculture and harvesting of forests in general

Forest operations; methods and equipment for forestry production in general

Urban forestry; shelterbelts and windbreaks

Pollution from forestry production operations, add W000

For:

*drainage and irrigation, use P210 and K001
*forest ecology, use F300 and K001
*forest soils, use J000-J800 as appropriate and K001
*pests and disease, use F800-F840 and K001
*physiology and biochemistry of forest trees, use F600 and K001
*planning and management of silviculture, use K200
*structure of forest trees, use F400 and K001
*taxonomy, nomenclature, and biogeography of forest trees, use F700 and K001
*range managment as a part of forest operations, use F130 and K001
*tree breeding and genetics, use F20 and K001
*weed control, use F900 and K001

Earlier Codes: (70-1)45; (72-9) 3515

K110 Forestry production - natural regeneration

Care of forests for extensive silviculture

Silvicultural systems, silvicultural rotation, thinning, clearfelling system, selection system, timberstand improvement, control of growth and composition of forests, formation of stands, high forest systems, etc.

Renewal by self sown seeds or by vegetative means, coppicing, natural regeneration, regeneration by cutting or felling, etc.

Prescribed or controlled burning, add K810

Effect of weather and climate on forestry production, add B200

For:

*forest ecology, use F300 and K001
*forest harvesting and engineering, use K130
*planning and administration of silvicultural systems, use K200
*silvicultural equipment, use K130

Earlier Codes: (70-1) 45; (72-9) 3515

K120 Forestry production - artificial regeneration

Intensive silviculture methods

Renewal by sowing or planting; afforestation and reforestation, forest nurseries, container grown tree seedlings, direct sowing, underplanting, advance planting, etc.

Forest plantations; shade, ornamental and Christmas tree production

Forest seed production

Mycorrhiza used in silviculture, add J100

For:

*forest breeding and genetics, use F200 and K001
*silvicultural and harvesting equipment, forestry engineering, use K130

Earlier Codes: (70-1) 45; (72-9) 3515

K130 Forestry production - harvesting and engineering

Forest engineering, silvicultural equipment and structures, site clearing, grading, slope stability, etc.

Wood production: logging and other forms of harvesting: handling, primary processing, and on-site storage of forest products

Forest roads, transport of forest products in the forest and to the mill

For:

*distribution and marketing of forest products, use E700 and K001
*transportation of finished forest products, use E700 and K001
*wood preservation, use K510

Earlier Codes: (70-1) 45; (72-9) 3520
Strategy Considerations: Earlier codes include more than forest harvesting and engineering; use appropriate terminology to focus search results.

K200 Forest management

Management of extensive and intensive silviculture

Organization, operation, administration, and conservation of resources of the forest; experimental forests, private forests, farm woodlands, etc.

Economic policies, planning, and development, of forestry

resources

Forestry labor organization and management: manpower and employment

Forestry finance: cost and returns specifically related to forestry; cost factors: capital, materials, labor; taxation; insurance; valuation; subsidies, credits, etc.

For:

*forest engineering, use K130
*legislation in forestry, use D500 and K001
*conservation of forest plant or animal species, use P000 and K001
*conservation of forest recreation land, use P300 and K001

Earlier Codes: (70-1) 45; (72-9) 3510

K250 Forest mensuration and description

Forest mensuration: systems and units of measurement forest dimensions and volume of trees, stands, forests, and timber; increment and yield tables

Computer modelling of forest stands

Assessment of site quality; forest mapping, surveying, and reconnaissance

Earlier Codes: (70-1) 45; (72-9) 3510
Strategy Considerations: Earlier codes include more than forest mensuration and description; use appropriate terminology to focus search results.

K500 Forest products - general

Forest products properties and industries in general

Pollution from forest industries, add W000

For:

*distribution of forest products, use E700 and K500-K590
*grading, standards, labelling, codes, use E710 and K500-K590
*trade, marketing, prices, use E700 and K500-K590

Earlier Codes: (70-1) 45; (72-9) 3520

K510 Forest products - wood

Timber and lumber; primary and secondary processing; sawmills; seasoning and timberyard practices; equipment; etc.

Woodworking, sawing, planing, milling, machining, joining, etc.

Physical and mechanical properties; wood structure and identification, add F400

Grading, standards, labelling, building codes for wood, add E710

Construction as related to wood properties in structures, furniture, containers, etc.

Wood preservation and protection from injuries, animals and insects, add F850-F851; double index decay, rot, blue stain, etc. to F830-F833 when causal organism is known

Fire testing, treatment for fire resistance, etc.

Pollution from wood industries, add W000

Fuelwood, add appropriate energy category P100-P140

Earlier Codes: (70-1) 45; (72-9) 3520
Strategy Considerations: Earlier codes are broader in scope; include appropriate terminology to focus search results.

K520 Forest products - composite and reconstituted wood

Plywood, veneers, built up stock, fiberboard, hardboard, particle board, chipboard, etc.: processing, properties and application

Adhesives, bonding

Grading, standards, labelling and building codes, add E710

Pollution from formaldehyde or other wastes, add W000

Earlier Codes: (70-1) 45; (72-9) 3520
Strategy Considerations: Earlier codes are broader in scope; include appropriate terminology to focus search results.

K530 Forest products - pulp and paper

Pulp mills; paper, packing materials, insulation materials, etc. made fromp pulp

Properties of the pulp product related to properties of the wood

Pollution from pulp mills, add W000

For:

*fiberboard, use K520
*pulp and paper from materials other than wood, such as sugar-cane bagasse, bamboo, kinaf, etc. use S200

Earlier Codes: (70-1) 45; (72-9) 3520
Strategy Considerations: Earlier codes are broader in scope; include appropriate terminology to focus search results.

K540 Forest products - chemicals

Chemical products and distillates: naval stores, oleoresins, resins, rosins, turpentines, tars, pitch, tall oil, etc.

Chemistry of cellulose and lignins

Other products such as gums, oils, waxes, dyestuffs, etc. from forest trees

Earlier Codes: (70-1) 45; (72-9) 3520
Strategy Considerations: Earlier codes are broader in scope; include appropriate terminology to focus search results.

K590 Forest products - miscellaneous

Minor forest products: indirect products such as osiers, canes, construction materials, etc.

Forest byproducts: production of products from bark, sawdust, chips, forest tree leaves and branches, etc.; byproducts used as fuel, add appropriate category P100-P140

Christmas trees and greens

For:

*growing Christmas trees, use K120

Earlier Codes: (70-1) 45; (72-9) 3520

K800 Forest injuries and protection

General techniques of forestry protection

Injuries (except pests and diseases) caused by man, vertebrate animals, atmospheric factors (including acid rains), equipment, toxic chemicals, and other physical or non-biogenic agencies; for pollution injuries, add W000

Materials, equipment, methods, and programs for prevention and control of forest injuries

For:

*diseases of forest trees and their control, use F830-F833 and K001 (earlier codes 4505-4520)
*forest environment conservation, use P300 and K001
*forest fires, use K810
*forest weeds, parasitic plants of forest trees, and their control, use F900 and K001 (earlier code 4525)
*pests of forest trees and their control, use F820-F822 and K001 (earlier code 4545)
*physiological and nutritional disorders of forest trees, use F840 and K001

Earlier Codes: (70-1) 45; (72-9) 3505

K810 Fire management

Forest fires: predisposing factors and causes, fire danger rating, forest fire research, fire prevention; techniques, programs, and equipment for forest fire detection and control, fire fighting equipment

Atmospheric effects on fire, add B200

Prescribed burning, add K110

Earlier Codes: (70-1) 45; (72-9) 3505, 3515

L000 ANIMAL SCIENCE

General animal science or zoology as it relates to agriculture

Associations; techniques and methods of research

Specific research goes with subject

Earlier Codes: (70-1) 20; (72-9) 2505

L001 Entomology related (1981-)

Entomology includes insects, Myriopoda (Diplopoda, Pauropoda, Chilopods, Symphyla), Arachnida, Isopoda (terrestrial only), and Onychophora

Used as a second or third category to indicate that the preceding category is insect related

Earlier Codes: (70-1) 35; (72-9) 5005

L002 Apiculture related (1981-)

Honey-bees (Apis mellifera, Apis dorsata, Apis flores, Apis indica, etc.) Stingless honey-bees (Meliponini)

Used as a second or third category to indicate that the preceding category is apiculture related

Earlier Codes: (70-1) 20; (72-9) 5015
Strategy Considerations: Earlier codes are broader in scope; include appropriate terminology to focus search results.

L003 Sericulture related (1981-)

Silk-worms (Bombyx mori, Anteraea pernyi, Samia cynthia ricini, etc.)

Used as a second or third category to indicate that the preceding category is sericulture related

Earlier Codes: (70-1) 20; (72-9) 5015
Strategy Considerations: Earlier codes are broader in scope; include appropriate terminology to focus search results.

L100 Animal production

General animal husbandry; production and care of domestic animals and other non-aquatic animals

Rearing, training, testing, housing, sexing, branding, and other means of identifying, exhibiting, judging

Dairy farming, poultry farming: etc.

Apiculture, add L002; sericulture, add L003; other insects, add L001

Yields; harvesting and handling of animal products

Slaughterhouse practice

For:

*animal breeding, use L200
*animal feeding, use L500
*aquaculture of animals, use M120
*distribution and marketing of animal products, use E700

*grading, use E710 and appropriate second category
*legislative aspects of quality control of animal products, use D500
*processing, storage and industry of animal nonfood or nonfeed products, use S100
*transportation of animal products, use E700

Earlier Codes: (70-1) 20; (72-9) 2505

L200 Animal genetics

Breeds, lines, strains

Genetics; heredity; variation; selection; pedigrees; germplasm banks

Breeding programs; breeding methods and techniques; artificial insemination, linebreeding, in-breeding, crossbreeding, hybridization, etc.

Insect breeding, add L001, L002, or L003

Registration of animal breeds, add D500

Breeding for animal disease control, add L830-L833

Breeding for animal pest control, add L820-L822

For:

*animal resistance to climate, extreme conditions, use L600
*hereditary disorders in animals, use L840
*legislative aspects of animal breeders' rights, use D500

Earlier Codes: (70-1) 20; (72-9) 2520
Strategy Considerations: 1972-79 code also includes reproduction physiology; narrow focus with appropriate terminology.

L210 Animal reproduction

Reproductive physiology; spermatogenesis, oogenesis, sex hormones, estrus, pregnancy, parturition, fertility, egg hatching, etc.

Insect reproduction, add L001, L002, or L003

For:

*reproductive disorders in animals, use L840
*surgical intervention in parturition, use L800
*ultrastructure of reproductive system, use L400

Earlier Codes: (70-1) 20; (72-9) 2520
Strategy Considerations: 1972-79 code also includes genetics; narrow focus with appropriate terminology. Be alert to British spellings in this field which may affect retrieval (e.g. oestrus, etc.)

L300 Animal ecology

Animals in relation to their environment; ecology; phenology

Environmental biology; effect of external influences on biological processes in domestic animals and other non-aquatic animals

Animal behavior; communication; instinct; learning

Habitat; population structure

Climatic seasonal factors: hibernation, migration

Community life, herds, colonies, symbiosis, etc.

Insect ecology, add L001, L002, or L003

For:

*animal resistance to climate, extreme conditions, use L600
*aquatic ecology involving animals, use M310
*conservation of animals, animal wildlife management, game reserves and surveys, game hunting and sport fishing, use P000

Earlier Codes: (70-1) 20; (72-9) 2510
Strategy Considerations: 1972-79 code also includes other areas such as anatomy and histology; narrow focus with appropriate terminology.

L400 Animal structure

Anatomy, cytology, histology, ultrastructure, and morphology of animals

Insect structures, add L00, L002, or L003

For:

*animal metamorphosis, use L600

Earlier Codes: (70-1) 20; (72-9) 2510
Strategy Considerations: 1972-79 code also includes other areas such as animal ecology and behavior; narrow focus with appropriate terminology.

L500 Animal nutrition

Feeding requirements, regimes, and diets of domestic animals

Nutritive value of feeds: feed formulas and supplements

Effects of feeding

Effects of feeding on physiology and biochemistry, add L600

Feeding methods: grazing, confinement, etc.

Insect nutrition, add L001, L002, or L003

Effect of grazing on pasture or range, add F130

Fish nutrition, add M001

For:

*feed and forage composition, use R300

*forage production, use F130 or F130
*human nutrition, use T000-T300 as appropriate
*nutritional disorders in animals, use L840
*physiology and biochemistry of nutrition in animals, use L600

Earlier Codes: (70-1) 20; (72-9) 2515

L600 Animal physiology and biochemistry

Physiology, biology and biochemistry, including metabolism, development, and growth of animals; metamorphosis

Biology of rumen microorganisms

Chemical analysis of animals

Resistance to climate, extreme conditions

Insect physiology and biochemistry, add L001, L002, or L003

For:

*animal nutrition, use L500
*immunology (general), use L800
*immunity; animal resistance to infection, use L830-L833
*immunologic and immunotherapeutic agents (veterinary), use L810 (1983-)
*nutritional physiology in man, use T200
*reproductive physiology, use L210

Earlier Codes: (70-1) 20; (72-9) 2510
Strategy Considerations: 1972-79 code also includes other areas such as animal ecology, behavior, and anatomy; narrow focus with appropriate terminology.

L700 Animal taxonomy and geography

Classification, identification, nomenclature, and phylogeny of animals

Paleontology (except ecological aspects)

Geographic distribution of animals; fauna

Insect taxonomy and geography, add L001, L002, or L003

Aquatic animal taxonomy and geography, add M001

For:

*animal ecology, use L300
*animal genetics, use L200
*soil fauna, use J100

Earlier Codes: (70-1) 20; (72-9) 2510, 5010

L800 Veterinary science and hygiene

General aspects of veterinary medicine; general articles on animal disease

Veterinary medicine as a profession; education, training, add C000-C210

Veterinary organization and services

Laboratory experiments, methods, and equipment

Pathology, including post-mortem examinations; diagnosis

Immunology (1983-)

Veterinary surgery, anaesthesia, dentistry, and obstetrics

Veterinary hygiene: animal health inspection

Animal quarantine regulations, add D500

For:

*deficiency diseases, use L840
*immunotherapeutic agents, use L810 (1983-)
*legislative aspects of hygienic control of animal products, use D500 and Q200 for food, R200 for feed, or S100 for nonfood or nonfeed animal products
*meat inspection, use Q200
*microbial animal diseases, use L830-L833

*physiological and metabolic disorders, use L840

Earlier Codes: (70-1) 20; (72-9) 3005

L810 Veterinary pharmacology, toxicology and immune therapeutic agents

(Code added January 1, 1983; earlier, consider searching L600, L800, L841)

Chemotherapeutic agents used in treating animal disease (including pharmacokinetics)

Veterinary biologics (vaccines, serums, bacterins)

Immunologic and immunotherapeutic agents and regimes used in preventing or diagnosing pathologic conditions of animals

Toxic substances (including toxic chemicals, herbicides, pesticides, poisonous plants, toxic drugs, etc.); physiologic effects produced by and biochemistry of substances toxic to animals

For:

*general toxicology, use X380
*general immunology principles, use X380
*general principles of pharmacology, use X380

Earlier Codes: (70-1) 20; (72-9) 3010

L820 Pests of animals - general and miscellaneous

Animals (other than insects, helminths, protozoa) as parasites of animals: their prevention and control (double index fish pests to M001): includes leeches, mollusca, etc.

Predators of animals: coyotes, dogs, hawks, etc.

Animals other than insects as vectors of pathogens of animals double index to L830-L833

Etiology, pathology, therapeutics, and prevention of diseases

caused by pests

Biology of pests

Pest control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control); breeding for animal pest control (double index to L200)

Pest surveys

Immunity; animal resistance to pests

Pests of insects, add L001, L002, or L003

For:

*animal quarantine regulations, use D500 and L800
*pesticides in general, use H000
*non-insect pests of stored products, use F850 or L850
*insect pests of stored products, use F851 or L851
*insects as parasites of animals, use L821
*non-insect parasites of animals, use L822

L821 Pests of animals - insects

Insects and other arthropods as parasites of animals (including man), their prevention and control (double index fish pests to M001)

Insects and other arthropods as vectors of pathogens of animals (double index to L830-L833)

Etiology, pathology, therapeutics, and prevention of diseases caused by insect pests

Biology of pests

Pest control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control); breeding for animal pest control (double index to L200)

Pest surveys

Immunity: animal resistance to pests

For:

*Insect pests of stored products, use L851

Earlier Codes: (70-1) 20; (72-9) 4555

L822 Pests of animals - helminths

Etiology, pathology, therapeutics, and prevention of diseases caused by helminths in animals (double index fish pests to M001)

Animals as vectors of diseases caused by helminths, double index to L820 or L821

Biology of pests

Pest control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control); breeding for animal pest control (double index to L200)

Pest surveys

Immunity: animal resistance to pests

Earlier Codes: (70-1) 20; (72-9) 3010
Strategy Considerations: Earlier codes were broader in scope; narrow focus with appropriate terminology.

L823 Pests of animals - protozoa (1981-)

Etiology, pathology, therapeutics, and prevention of diseases caused by protozoa in animals (double index fish pests to M001)

Animals as vectors of diseases caused by protozoa (double index to L820 or L821)

Biology of pests

Pest control materials, equipment, methods and programs (including

cultural, chemical, physical, mechanical, integrated, and biological control); breeding for animal pest control (double index to L200)

Pest surveys

Immunity; animal resistance to pests

Earlier Codes: (70-1) 20; (72-9) 3010
Strategy Considerations: Earlier codes were broader in scope; narrow focus with appropriate terminology.

L830 Animal diseases - general

Infectious diseases and their causal organisms in relation to animals (double index fish diseases to M001)

Zoonoses (animal diseases transmissible between animals and man)

Materials, equipment, methods, and programs for the prevention and control of animal diseases (including cultural, chemical, physical, mechanical, integrated and biological control); breeding for animal disease control (double index to L20)

Diseases surveys

Immunity; animal resistance to infection

For:

*animal quarantine regulations, use D500 and L800
*deficiency diseases, use L840
*diseases of insect origin, use L821
*diseases of helminth origin, use L822
*disorders caused by toxic chemicals, poisonous plants, use L810
*physiological disorders, use L840
*vectors of animal diseases, use L820-L822 and L830-L833
*injuries caused by physical, non-biogenic, non-chemical agencies, use L841

Earlier Codes: (70-1) 20; (72-9) 3010

L831 Animal diseases - fungal

Fungal diseases and their causal organisms in relation to animals (double index fish diseases to M001)

Zoonoses (fungal diseases transmissible between animals and man)

Materials, equipment, methods, and programs for the prevention and control of fungal diseases (including cultural, chemical, physical, mechanical, integrated and biological control; breeding for fungal disease control (double index to L200)

Disease surveys

Immunity; animal resistance to infection

Earlier Codes: (70-1) 20; (72-9) 3010
Strategy Considerations: Earlier codes ware broader in scope; narrow focus with appropriate terminology.

L832 Animal diseases - bacterial

Bacterial, rickettsia, and mycoplasmal diseases and their causal organisms in relation to animals (double index fish diseases to M001)

Zoonoses (bacterial diseasns transmissible between animals and man)

Materials, equipment, methods, and programs for the prevention and control of bacterial diseases (including cultural, chemical, physical, mechanical, integrated, and biological control); breeding for bacterial disease control (double index to L200)

Disease surveys

Immunity; animal resistance to infection

Earlier Codes: (70-1) 20; (72-9) 3010
Strategy Considerations: Earlier codes were broader in scope; narrow focus with appropriate terminology. In order to eliminate large numbers of items on brucellosis, it would be advisable to exclude items with the subfield tag BRU.

L833 Animal diseases - viral

Viral diseases and their causal organisms in relation to animals (double index fish diseases to M001)

Zoonoses (viral diseases transmissible between animals and man)

Materials, equipment, methods, and programs for the prevention and control of viral diseases (including cultural, chemical, physical, mechanical, integrated, and biological control); breeding for viral disease control (double index toL200)

Disease surveys

Immunity; animal resistance to infection

Earlier Codes: (70-1) 20; (72-9) 3010
Strategy Considerations: Earlier codes were broader in scope; narrow focus with appropriate terminology.

L840 Animal diseases - physiological

Physiological, metabolic, and nutritional disorders; deficiency diseases; their prevention and control (double index fish diseases to M001)

Congenital and hereditary disorders

Allergies

Neoplasms of unknown origin

Earlier Codes: (70-1) 20; (72-9) 3015

L841 Animal diseases - physical trauma

Injuries and other conditions (e.g. lacerations, strains, sprains, bone fractures, etc.) caused by physical, non-biogenic, non-chemical agencies, their prevention and control

Fish injuries, add M001

For:

*animal quarantine regulations, use D500 and L800
*diseases of helminth origins, use L822
*injuries and conditions caused by toxic chemicals (including herbicides and pesticides), poisonous plants, use L810
*microbial animal diseases, use L830-L833
*veterinary science and hygiene, use L800

Earlier Codes: (70-1) 20; (72-9) 3020
Strategy Considerations: Through 1982 injuries and conditions caused by toxic chemicals (including herbicides and pesticides), poisonous plants, etc. were indexed here. These are now indexed at L810; both codes should be searched for exhaustive retrieval.

L850 Protection of animal products - general and miscellaneous

Pests (except insects) and disease organisms injurious to stored or other products of animal origin: their occurrence and control

Injuries to stored or other animal products caused by atmospheric factors, fire, equipment, and other physical or non-biogenic agencies

Rodent control measures

For:

*food spoilage, use Q200
*methods of storage of food, use Q110

Earlier Codes: (70-1) 20; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry)
Strategy Considerations: 1972-979 codes were specific to major classes of animal products; include all when broad results are desired. For current materials narrow focus with appropriate terminology.

L851 Protection of animal products - insects

Insects (or other arthropod pests) injurious to stored or other products of animal origin; their occurrence and control

Earlier Codes: (70-1) 20; (72-9) 4550

M000 AQUATIC SCIENCES AND FISHERIES

General considerations of aquatics sciences, fisheries, and other aquatic resources

Associations, conferences, expeditions, research, etc.

Specific research or programs go with subject

Earlier Codes: A broad range of codes applied earlier.
Strategy Considerations: Aquatic sciences and fisheries literature was indexed previously under category codes most appropriate to agricultural research (e.g. plant production, water resources, etc.) The auxiliary code 7005 (Life Sciences) was heavily used for cataloging records during the period 1972-79. Word search strategies will be most successful for the period prior to 1980.

M100 Aquaculture related

Used as a second or third category to indicate that the preceding category is aquaculture related

Strategy Considerations: See note under M000.

M100 Aquaculture and fisheries - general

The exploration, improvement and management of aquatic resources, both plant and animal, for human use

Strategy Considerations: See note under M000.

M110 Fisheries production

Methods, organization and equipment (including fishing vessels) for freshwater and marine fishing: including fishing strategies, fishing grounds, etc.

Effect of water quality on fisheries productivity: temperature, chemistry, fertility, sediments, etc.

Whaling, sealing and catching of other marine animals

Harvesting and handling of fisheries products; primary processing and storage of fisheries non-food products; unloading and other quayside operations

Transportation of fisheries products, add E700

For:

*economic aspects, management, use M210
*sport fishing, use P000
*processing and industry of seafood products, use Q106
*storage of seafood, use Q116
*hygienic aspects of seafood products, use Q206

Strategy Considerations: See note under M000.

M120 Animal aquaculture

Production and care of fish, shellfish, and other aquatic animals, including breeding of ornamental fish

Fish and shellfish collecting and rearing systems

Freshwater, sea water and brackish water farming: ponds, hatcheries, tanks, pens, etc.

Water quality effect on production: temperature, chemistry, fertilization, filtering, sediments, disinfection, etc.

Culture of zooplankton as aquatic animal food

Methods, organization and equipment for production, harvesting and handling aquatic animals

For:

*feeding of fish and other aquatic animals, use L500 and M001
*processing and industry for seafood products, use Q106
*storage of seafood products, use Q116
*hygienic aspects of seafood products, use Q206
*packaging of seafood products, use Q306
*composition of seafood products, use Q506

Strategy Considerations: See note under M000.

M130 Plant aquaculture

Culture and harvesting of algae, phytoplankton, and other seaweeds and aquatic plants

Production of aquatic plants for food, feed, energy, drugs, or other human use

Water quality effect on production: temperature, chemistry, fertilization, sediments, CO2 enhancement, etc.

Methods, organizaten and equipment for production, harvesting, and handling aquatic plants

For:

*aquatic plant nutrition, use F500 and M001
*aquatic plant food products, use Q000-Q500

Strategy Considerations: See note under M000.

M200 Fisheries and aquaculture management - general

Management and conservation of aquatic life resources in general

Economic policies, planning and development of aquatic life resources

Strategy Considerations: See note under M000.

M210 Fisheries management

Organization, operation and administration of fisheries

Economic policies, planning and development of fisheries

Fisheries labor organization and management; manpower and employment

Fisheries finance: cost and returns; cost factors: capital, materials, labor; taxation; insurance valuation; etc.

Credit, interest rate, investment return

Stock assessment: sampling; overfishing; surveys

Legislation and fisheries, add D500

Strategy Considerations: See note under M000.

M220 Aquaculture management

Organization, operation, and administration of hatcheries, fish farms, and other enterprises concerning aquaculture

Economic policies, planning, and development of aquaculture

Aquaculture labor organization and management; manpower and employment

Aquaculture finance: cost factors: capital, materials, labor; taxation; insurance; valuation, etc.

Credit, interest rates, investment returns

Legislation and aquaculture, add D500

Strategy Considerations: See note under M000

M300 Aquatic biology and ecology - general

General biology and ecology of animals, plants, and all microbial

life in fresh, brackish, and marine waters; littoral life

Behavior, migrations, movements, rhythms

Productivity and population dynamics

Strategy Considerations: See note under M000.

M310 Aquatic biology and ecology - animals

Biology and ecology of animal life in fresh, brackish and marine waters; littoral life

Behavior: migrations, movements, rhythms

Productivity and population dynamics

Food and feeding in the natural habitat

For:

*feeding of animals in aquaculture, use L500 and M001
*diseases of aquatic animals, use L830-L833 and M001
*effects of water pollution, use W000 and M001
*pests of aquatic animals, use L820-L822 and M001
*miscellaneous disorders, use L841 or L810 and M001
*physiological disorders, use L840 and M001

Strategy Considerations: See note under M000

M320 Aquatic biology and ecology - plants

Biology and ecology of plant life in fresh, brackish and marine waters

Ecology, phenology, environmental biology, external influence on biological processes in aquatic plants

For:

*aquatic plant breeding, use F200 and M001
*aquatic plant structure, cytology, use F400 and M001

*aquatic plant nutrition, use F500 and M001
*aquatic plant physiology and biochemistry, use F600 and M001
*aquatic plant taxonomy, use F700 and M001
*aquatic plant pests and diseases, use F820-F841 and M001
*aquatic weeds, use F900 and M001

Strategy Considerations: See note under M000

M400 Oceanography

Chemical and physical aspects of marine science

Submarine topography, including marine contour surveys; mapping

Statics; dynamics; ocean currents

Oceanographic forms: lagoons, coastal pools, inland seas, marine channels, etc.

For:

*desalination, use P200
*marine biology, use M300-M320
*marine pollution, use W000 and M001
*water chemistry and quality, use P200
*effect of water quality on fisheries production, use M110
*effect of water quality on aquaculture, use M120 or M130

Strategy Considerations: See note under M000.

M500 Limnology

Chemical and physical aspects of fresh-waters and their subaquatic topography

Statics; dynamics; river and lake currents

Fresh-water areas: lakes, ponds, marshes; rivers, streams, falls; etc.

For:

*applications in hydrology, use P200
*freshwater biology, use M300-M320
*water chemistry and quality, use P200
*water pollution, use W000 and M001
*Water resources, use P200
*effect of water quality on fisheries production, use M110
*effect of water quality on aquaculture, use M120 or M130

Strategy Considerations: See note under M000.

N000 AGRICULTURAL ENGINEERING

General considerations on engineering in relation to agriculture; associations, history, education, etc.

Safety enginering; fire detection and control (but not forest fires); safety devices, accident prevention equipment

Education and training, add C000-C210

For:

*forest fires, use K810
*social aspects of accident prevention, use E500

Earlier Codes: (70-1) 30; (72-9) 5505

N100 Structure and structural equipment

Design, materials, construction, and maintenance of such structures as farm-houses; animal housing; plant housing, glasshouses, etc.; farm storage buildings; barns, silos, etc.; harvest preparation and conditioning buildings; ancillary buildings; garages, toolsheds, etc.; enclosures and protection installations; etc.

Farm waters supply systems; sewage and waste disposal systems; walls and fences

Rural roads: design, construction, maintenance

Structural equipment; excavation and earth-moving equipment;

hoisting and conveying equipment,; etc.

For:

*drainage and irrigation structures, use P210
*fisheries engineering, use M100-M130
*forest engineering, use K130
*power sources and use, use P100-P140

Earlier Codes: (70-1) 30; (72-9) 5505

N200 Farm equipment

Hand and power equipment and machines

Equipment used in crop production including: tillage, fertilization, sowing, planting, crop maintenance, harvesting, loading, harvest preparation and conditioning, etc.

Equipment used in animal production including: feeding, care, maintenance, dairying operations, etc.

Transportation equipment, including powered transport; tractors, trunks, etc., and non-powered transport: wagons, carts, etc.

For:

*animal disease control equipment, use L830-L833
*animal pest control equipment, use L820-L822
*drainage and irrigation equipment, use P210
*fisheries equipment, use M100-M130
*food processing equipment, use Q100
*forestry production, use K130
*forest harvesting equipment, use K130
*forest fire detection and control equipment, use K710
*forest industries equipment, use K500-K590
*meteorological instrumentation and equipment, use B200
*plant disease control equipment, use F800, F830-F833
*plant pest control equipment, use F800, F820-F822
*weed control equipment, use F900

Earlier Codes: (70-1) 30; (72-9) 5510

P000 NATURAL RESOURCES

General aspects of natural (biological) resources in relation to agriculture, fisheries (double index to M001), or forestry (double index to K001)

Conservation of plants and vegetation; plant wildlife management; botanical gardens, aboretums

Conservation of animals; animal wildlife management; game reserves and surveys; game hunting and sport fishing

Forest wildlife, add K001

For:

*animal ecology, use L300
*energy resources, use P100-P140
*fisheries resources, use M000
*management of forest resources, use K200
*land resources, use P300
*landscape and scenery preservation, use P300
*plant ecology, use F300
*recreational uses, use P300
*soil resources, use J600
*water resources, use P200

Earlier Codes: (70-1) 55; (72-9) 6505

P100 Energy resources - general

Energy situations; general aspects of energy sources and use

Energy awareness, economics, policy, supply and demand; energetics, energy accounting, energy budget, energy flow, energy ratio, energy subsidy

Rural electrification

Earlier Codes: (70-1) 55; (72-9) 5505, 7505, 8505
Strategy Considerations: Earlier codes are very broad; focus results with appropriate terminology.

P110 Conservation and use energy

In production, processing, marketing and consumption of crops, livestock, forestry, etc.; in rural housing, transportation and development

Energy use in agriculture including animal draft, cultural energy

Invested energy in fertilizer, food energy, harvesting, irrigation, tillage, transportation, agricultural chemicals

Handling, cost, electrical engineering

Energy in the food processing industry

Fuel consumption, recycling

Energy aspects of nitrogen fixation

Forestry use of energy, add K001

Earlier Codes: (70-1) 55; (72-9) 5505, 7505, 8505
Strategy Considerations: Earlier codes are very broad; focus results with appropriate terminology.

P120 Biomass energy sources

Development of renewable energy and petroleum substitutes from agricultural and forestry products and residues, energy farming crops, microorganisms

Biomass or organic sources including agroindustrial wastes, algae, animal waste, crop residues, energy crops, manure, wood

Processes include alcoholic fermentation, anaerobic fermentation, direct combustion, distillation, gas production, gasification, photosynthesis

Products include alcohol, biogas, ethanol gobargas, methane, methanol

Forestry energy sources, add K500-K590

Earlier Codes: (70-1) 55; (72-9) 5505, 7505, 8505
Strategy Considerations: Earlier codes are very broad; focus

results with appropriate terminology.

P130 Alternative sources of energy

Development of technology and equipment for use in agriculture of alternative sources of energy; solar, wind, geothermal, coal, lignite, oil shale, peat, electricity, waste heat, wastes, hydropower, magnetohydrodynamics, nuclear, photovoltaics, seathermal, SNG, stirling engine, wave, tidal, etc.

Processes include coal gasification, combustion, liquefaction, pyrolysis

Earlier Codes: (70-1) 55; (72-9) 5505, 7505, 8505
Strategy Considerations: Earlier codes are very broad; focus results with appropriate terminology.

P140 Consequences of energy production and use

Consequences of energy production and use on agriculture, forestry, natural resources, reclamation, environment, etc.

Social implications, technology assessment

Effect on environment, land use, population, radiation, ozone, pollution, etc.

Effect on forestry, add K001

Pollution effect, add W000

Earlier Codes: (70-1) 55; (72-9) 5505, 7505, 8505
Strategy Considerations: Earlier codes are very broad; focus results with appropriate terminology.

P200 Water resources and management

Water resources and management, planning, and development: water surveying and mapping, water supply, groundwater prospecting, integrated development of surface and groundwater, river basin development, water right, water use, watershed management

Water conservation; use of waste waters in agriculture

Water chemistry, chemical analysis of water; desalination

Nature and quality of water: brackish water, desalinated water, drinking water, freshwater, saline water, sea water for agriculture, aquaculture, rural living, etc.

Flood forecasting, flood and river control, torrent control

Resource potentialities and assessment of water for use in agriculture, fisheries, or forestry; includes water requirements for man

Hydrodynamics, hydrogeology, hydrology, hydrography, hydrometry, lysimetry, etc.

For:

*drainage and irrigation, use P210
*erosion control, use J800
*hydraulics, use P210
*induced rainfall, use B200
*irrigation development, use P210
*limnological applications, use M300
*meteorology and climatology, use B200
*oceanographical applications, use M200
*soil erosion by water, use J800
*water as power source, use P130
*water in soils, use J200
*water pollution and control, use W000

Earlier Codes: (70-1) 85; (72-9) 6020 focus results with appropriate terminology.

P210 Drainage and irrigation

Agricultural hydraulics

Equipment and machinery: detection equipment, ditching equipment, drainage machinery, drilling equipment, hydraulic equipment and machinery, irrigation equipment, etc.

Construction, operation, and maintenance of wells, dams, reservoirs, conduits and canals, etc.

Water conveyance and distribution

Irrigation: irrigation development, irrigation methods and systems: basin irrigation, border irrigation, contour check irrigation, furrow irrigation, gravity irrigation, overhead irrigation, subsurface irrigation, trickle irrigation, sprinkling, etc.

Drainage

For:

*cultivation under irrigation, use J700
*flood and river control, use P200
*water in soils, use J200
*water requirement of plants, use F600

Earlier Codes: (70-1) 85; (72-9) 6020

P300 Land resources

Land resources in general

Conservation and restoration of natural environment; national parks, recreational land, wilderness areas

Forest environment conservation; recreational use of forest land, add K001

Recreational use of farm land

Landscape management, landscape and scenery preservation

Forest related land resources, add K001

Forest injuries caused by recreational use, add K800

For:

*economics of land development, reform, and utilization, use E110
*gardening, use F110
*soil resources, use J600

Earlier Codes: (70-1) 85; (72-9) 6505

Q000 FOOD SCIENCE AND FOOD PRODUCTS

Food science and products in general

Distribution and marketing of food products, add E700

Beverages, edible oils

For:

*animal feeds and nutrition, use L500, R000-R300 as appropriate
*nutrition standards, use T300
*food constituents and composition, use Q500
*food contamination and toxicology, use Q200
*human nutrition, use T000-T300 as appropriate
*legislative aspects of hygienic control of food products, use D500 and Q200
*food grading, standards and labelling, use E710 and Q500

Earlier Codes: (70-1) 15,40; (72-9) 2005

Q001-Q006 Commodity subdivisions (general)

(Q006 added January 1, 1982; earlier consider searching Q000 for fish and aquatic products)

Q001 DAIRY PRODUCTS

Q002 LIVESTOCK PRODUCTS

Q003 POULTRY PRODUCTS

Q004 FIELD CROP PRODUCTS

Q005 HORTICULTURAL CROP PRODUCTS

Q006 FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15, 40; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)

Q100 Food processing

Basic technologies applied to the conversion of primary products into food for man

Planning and development of industries for the processing of food products

Equipment and processing techniques of food and drink manufacture

Methods of preservation of foodstuffs and processed foods

For:

*distribution and marketing of food products, use E700 and Q000
*economic aspects of food situation planning, requirements, and supply, use E300
*feed processing and storage, use R100
*nutrition standards, use T300
*food constituents and composition, use Q500
*food contamination, toxicology, use Q200
*food quality, use Q500
*human nutrition, use T000-T300 as appropriate
*legislative aspects of hygienic control of food products, use D500 and Q200

Earlier Codes: (70-1) 15, 40; (72-9) 2005
Strategy Considerations: Earlier codes encompassed not only processing, but also storage and analysis; use appropriate terminology to focus results.

Q101-Q106 Food processing subdivided by commodity type

(Q106 added January 1, 1982; earlier consider searching Q100 for fish and aquatic products)

Follow scheme for Q001 through Q006

Q001 DAIRY PRODUCTS Q004 FIELD CROP PRODUCTS

Q002 LIVESTOCK PRODUCTS Q005 HORTICULTURAL CROP PRODUCTS

Q003 POULTRY PRODUCTS Q006 FISH AND AQUATIC PRODUCTS

For:

*primary processing and storage of non-food animal products, use S100
*primary processing and strorage of non-food plant products, use S200
*primary processing and storage of fisheries non-food products, use M100
*protection of stored food products, use F850-F851, L850-L851

Earlier Codes: (70-1) 15, 40; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes encompassed not only processing, but also storage and analysis; use appropriate terminology to focus results.

Q110 Food storage

Methods of storage of food products: effects of storage conditions on food quality; temperature, controlled atmosphere, radiation, etc.

Shelf life

Development of or contamination with toxic substances or deleterious organisms during storage, add Q200

For:

*protection of stored food products (general), use F850, L850

*protection of stored food products from insects, use F851, L851

Earlier Codes: (70-1) 15,40; (72-9) 2005
Strategy Considerations: Earlier codes encompassed not only storage, but also processing and analysis; use appropriate terminology to focus results.

Q111-Q116 Food storage subdivided by commodity type

(Q116 added January 1, 1982; earlier consider searching Q110 for fish and aquatic products)

Follow scheme for Q001 through Q006)

Q001 DAIRY PRODUCTS Q004 FIELD CROP PRODUCTS

Q002 LIVESTOCK PRODUCTS Q005 HORTICULTURAL CROP PRODUCTS

Q003 POULTRY PRODUCTS Q006 FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15, 40; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes encompassed not only storage, but also processing and analysis; use appropriate terminology to focus results.

Q120 Microbiology of food processing

Food microbiology, including industrial microbiology, methods of using microbes; industrial fermentation processes, manufacture of enzymes from micro-organisms; industrial bacteriology; single cell protein

For:

*deleterious food microorganisms, use Q200

Earlier Codes: (70-1) 15,40; (72-9) 2005
Strategy Considerations: Earlier codes encompassed not only microbiology, but also processing, storage, etc.; use

appropriate terminology to focus results.

Q121-Q126 Microbiology by commodity type

(Q126 added January 1, 1982; earlier consider searching Q120 for fish and aquatic products)

Follow scheme for Q001 through Q006

Q001	DAIRY PRODUCTS	Q004	FIELD CROP PRODUCTS
Q002	LIVESTOCK PRODUCTS	Q005	HORTICULTURAL CROP PRODUCTS
Q003	POULTRY PRODUCTS	Q006	FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15, 40; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes encompassed not only microbiology, but also processing, storage, etc.; use appropriate terminology to focus results.

Q200 Food contamination and toxicology

Deleterious food microorganisms

Food toxicology and spoilage: defects, diseases, adulteration, contamination

Public health aspects of foodstuffs: meat inspection, food hygiene, food disease control, etc.

Legislative aspects of hygienic control of food products, add D500

For:

*nutrition standards, use T300
*food quality, use Q500
*legislative aspects of quality control of food products, use D500 and Q500
*contamination and toxicology of feeds, use R200
*protection of stored food products, use F850-F851, L850-L851

Earlier Codes: (70-1) 15, 40; (72-9) 1505
Strategy Considerations: Earlier codes include other aspects of consumer protection as well; use appropriate terminology to focus search results.

Q201-Q206 Food contamination by commodity type

(Q206 added Janury 1, 1982; earlier consider searching Q200 for fish and aquatic products)

Follow scheme for Q001 through Q006

Q001	DAIRY PRODUCTS	Q004	FIELD CROP PRODUCTS
Q002	LIVESTOCK PRODUCTS	Q005	HORTICULTURAL CROP PRODUCTS
Q003	POULTRY PRODUCTS	Q006	FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15,40; (72-9) 1505
Strategy Considerations: Earlier codes are not product specific and encompass other aspects of consumer protection as well. Use appropriate terminology to focus search results.

Q300 Food packaging

Canning, bottling, hermetic sealing, vacuum packing, wrapping, coating, packeting, etc.

For:

*distribution and marketing of food products, use E700 and Q000
*food preservation methods, use Q100
*food storage, use Q110

Earlier Codes: (70-1) 15, 40; (72-9) 2005
Strategy Considerations: Earlier codes include other aspects such as processing, chemistry, storage, etc.; use appropriate terminology to focus results.

Q301-Q306 Food packaging by commodity type

(Q306 added January 1, 1982; earlier consider searching Q300 for fish and aquatic products)

Follow scheme for Q001 through Q006

Q001 DAIRY PRODUCTS Q004 FIELD CROP PRODUCTS

Q002 LIVESTOCK PRODUCTS Q005 HORTICULTURAL CROP PRODUCTS

Q003 POULTRY PRODUCTS Q006 FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15, 40; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes include other aspects such as processing, chemistry, storage, etc.; use appropriate terminology to focus results.

Q400 Food additives

Color, flavor, seasoning, emulsifier, stabilizer, sweetener, etc.

Toxicity of food additives, add Q200

For:

*public health aspects of foodstuffs, use Q200
*residues of pesticides, use H000

Earlier Codes: (70-1) 15, 40; (72-9) 1505, 2005
Strategy Considerations: Earlier codes include other aspects such as processing, toxicology, etc.; use appropriate terminology to focus search results.

Q401-Q406 Food additives by commodity type

(Q406 added January 1, 1982; earlier consider searching Q400 for fish and aquatic product

Follow scheme for Q001 through Q006

Q001 DAIRY PRODUCTS Q004 FIELD CROP PRODUCTS

Q002 LIVESTOCK PRODUCTS Q005 HORTICULTURAL CROP PRODUCTS

Q003 POULTRY PRODUCTS Q006 FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15, 40; (72-9) 1505, 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes include other aspects such as processing, toxicology, etc.; use appropriate terminology to focus search results.

Q500 Food composition

Constituents and composition of foods (includes foods of plant and animal origin, artificial foods, stimulants (e.g. caffeine), etc.

Chemical analysis of food

Food composition nutrients: proteins, amino acid, nitrogen, carbohydrates, lipids, minerals, enzymes, vitamins, etc.

Food quality: nutritive value, caloric value, organoleptic value, taste quality; analysis, testing; laboratory experiments

Grading, standards and labelling of food, add E710

For:

food additives, use Q400
*nutrition standards, use T300
*legislative aspects of hygienic control of food products, use D500 and Q200

Earlier Codes: (70-1) 15, 40; (72-9) 1510, 2005
Strategy Considerations: Earlier codes include other aspects such as processing, toxicology, etc. Use appropriate terminology to focus search results.

Q501-Q506 Food composition by commodity type

(Q506 added January 1, 1982; earlier consider searching Q500 for fish and aquatic products)

Follow scheme for Q001 through Q006

Q001 DAIRY PRODUCTS Q004 FIELD CROP PRODUCTS

Q002 LIVESTOCK PRODUCTS Q005 HORTICULTURAL CROP PRODUCTS

Q003 POULTRY PRODUCTS Q006 FISH AND AQUATIC PRODUCTS

Earlier Codes: (70-1) 15, 40; (72-9) 1510, 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes include other aspects such as processing, toxicology, etc. Use appropriate terminology to focus search results.

R000 FEED PRODUCTS

Feed science and products in general

Distribution and marketing of feed products, add E700

Earlier Codes: (70-1) 15; (72-09) 2035

R100 Feed processing and storage

Forage and silage processing

Planning and development of feed industry

Methods of preservation and storage of processed feeds

Feed manufacture

For:

*microbiology of feed processing, use R110

*constituents and composition of feeds, use R300
*distribution and marketing of feeds, use E700 and R000
*feed contamination and toxicology, use R200
*feed quality, use R300
*legislative aspects of quality control of feeds, use D500 and R300
*protection of stored feeds (general), use F850
protection of stored feeds from insects, use F851

Earlier Codes: (70-1) 15; (72-9) 2035

R110 Microbiology of feed processing

Methods of using microbes in feed processing

Fermentation, enzymes, single cell protein, fodder yeasts, etc.

Earlier Codes: (70-1) 15; (72-9) 2035

R200 Feed contamination, toxicology

Deleterious feed microorganisms

Spoilage; disease organisms in feed

Feed toxicology, adulteration and contamination

Legislative aspects of hygienic control of feeds, add D500

For:

*feed quality, use R300

Earlier Codes: (70-1) 15; (72-9) 2035

R300 Feed composition

Constituents and composition of feeds

Chemical analysis of feeds

Feed quality: analysis, testing; laboratory experiments

Feed additives

Energy evaluation of feeds

Grading, standards, and labelling of feeds, add E710

For:

*feed nutritive value, feed formulas and supplements, use L500
*legislative aspects of hygienic control of feeds, use D500 and R200

Earlier Codes: (70-1) 15; (72-9) 2035

S000 AGRICULTURAL PRODUCTS - GENERAL

Processing, properties, and storage of agricultural products in general

Animal and plant products other than food, feed, forestry, or fishery products; general articles

For:

*food products, use Q000-Q500
*feed products, use R000-R300
*forestry products, use K000-K590
*fishery products, use M100
*legislative aspects of agricultural products, use D500
*marketing of agricultural products, use E700
*protection of stored products, use F850-F851, L850-L851

Earlier Codes: (70-1) 15; (72-9) 2005
Strategy Considerations: Earlier codes include some food products as well; use appropriate terminology to focus search

results.

S100 Agricultural products - animal

Processing, properties, and storage of animal nonfood or feed products: wool, fur, hides, leather, silk, adhesives, etc.

Fertilizer animal products, add J500

For:

*protection of stored animal products, use L850-L851

Earlier Codes: (70-1) 15; (72-9) 2005 (general), 2010 (dairy), 2015 (livestock), 2020 (poultry)
Strategy Considerations: Earlier codes include some food products as well; use appropriate terminology to focus search results.

S200 Agricultural products - plant

Processing, properties and storage of plant nonfood or nonfeed products: fibers, tobacco, drugs, gums, rubber, pulp and paper from nonforest sources, etc.

Fertilizer or mulch plant products, add J500

Pesticide compounds extracted from plants, add H000

For:

*protection of stored plant products, use F850-F851

Earlier Codes: (70-1) 15; (72-9) 2005 (general), 2025 (field crops), 2030 (horticultural crops)
Strategy Considerations: Earlier codes include some food products as well; use appropriate terminology to focus search results.

T000 HUMAN NUTRITION

Attitudes of man in relation to foods and feeding, including behavioral, psychological, and social aspects, food fads, health foods

Food consumption of populations; consumer oriented research on food, dietary surveys

General human nutrition; nutritional status of populations

For:

*animal nutrition, use L500
*economic aspects of food situation planning, requirements, and supply, use E300
*food quality, use Q500
*nutrition standards, use T300
*physiology of human nutrition, use T200
*toxicology and public health aspects of food, use Q200

Earlier Codes: (70-1) 40; (72-9) 1510

T100 Nutrition education

Includes health education

Methods of teaching nutrition, training techniques, behavior change techniques

Programs and materials in nutrition education: development of programs and materials, curricula, nutrition education activities (games, posters, etc.); teaching aids, children's books (food and cooking nutrition), textbooks, researcher references in nutrition education

Professional education in nutrition: internships, medical schools, continuing education, symposia and conferences on nutrition education

Parent and community involvement: nutrition clubs, public service announcements, mass media, audiences

Evaluation of nutrition education programs, materials, practices:

objectives, implementation, assessment, analysis, criteria, guidelines, nutrition surveys, nutrition knowledge tests, attitudes and applied knowledge

U.S. extension nutrition education, add C210

Earlier Codes: (70-1) 40; (72-9) 1510, 1511 (FNIC, 1979)
Strategy Considerations: Codes 40 and 1510 include other aspects of human nutrition; use appropriate terminology to focus search results.

T120 Food service management

Institutional management

Quantity food menus: planning, forecasting, merchandising, trends, recipes, modified diets, food purchasing

Quantity food preparation, procedures, and training manuals

Quantity food equipment: use, care of, purchasing

Facilities planning: laycut, design, esthetics

Food service systems

Food servcice trends

Plate waste

Food service sanitation, add Q200

Energy use and conservation, add P110

Earlier Codes: (70-1) 40; (72-9) 1510 (NAL), 1530 (FNIC), 1540-1555 (FNIC), 1516 (FNIC, 1979)
Strategy Considerations: Earlier NAL codes include more than institutional food service; use appropriate terminology to focus search results. FNIC codes are oriented to institutional food service.

T200 Physiology of human nutrition

Nutritional physiology in man: metabolism and utilization of nutrients; digestion

Hunger, thirst, inanition; nutritional requirements and growth, nutritional requirements and external environment

Anthropometry

Breast feeding, nutrition in relation to the life cycle

For:

*general human physiology, use X300
*nutrition standards, use T300

Earlier Codes: (70-1) 40; (272-9) 1510 (FNIC & NAL), 1512 (FNIC, 1979)
Strategy Considerations: Code 1510 includes diet and disease material as well; use appropriate terminology to focus search results.

T300 Diet and diet related diseases

Human diet in relation to health and disease

Feeding regimes; diets: balanced diet, calorie requirement, dietary pattern, etc.

Nutritional and metabolic diseases and disorders (obesity, diabetes phenylketonuria, pellagra, xerophthalmia, rickets, etc.), caloric deficiency, vitamin deficiency, protein deficiency, etc.

Food allergies; malnutrition (individual)

Nutrition standards; recommended dietary allowances

Parenteral feeding

Laboratory animal research related to human diet

For:

*animal nutrition, use L500
*food and eating habits, use T000
*home preparation of food and meals, use U000
*non diet-related diseases, use X380
*nutritional and metabolic diseases and disorders in animals, use L840

Earlier Codes: (70-1) 40; (72-9) 1510 (FNIC & NAL), 1513 (FNIC, 1979)
Strategy Considerations: Code 1510 includes material on the physiology of nutrition as well; use appropriate terminology to focus search results.

U000 HOME ECONOMICS

Programs for the development of home economics

Home industries

Food in the home; preparation of meals and cooking of food; home food storage; home food preservation

Houses and household equipment; basic requirements for houses, their furnishing and equipment

Housekeeping; family living and management practices, household accounts

Consumer protection other than food

Care of children in the home

Conservation and use of energy in the home, add P110

For:

*diets, use T300
*health and welfare, use E550
*human ecology, rural sociology, use E500
*safety devices, add N000
*toxicology and public health aspects of food, use Q200

Earlier Codes: (70-1) 40; (72-9) 1505, 1515

V000 HUMAN PARASITOLOGY

(Code added January 1, 1983)

Parasites and parasitic diseases of humans: general human parasitology including broad reviews, textbooks, and manuals, theoretical articles, and biographies, necrologies, etc. of medical parasitologists

For:

*general and miscellaneous parasites of humans, use V820
*insects and other arthropod parasites of humans, use V821
*helminths of humans, use V822
*protozoa of humans, use V823
*biographies, necrologies, etc. of veterinary parasitologists, use L000

Strategy Considerations: Human parasitology has only recently been included in the scope of the database. For earlier works use appropriate terminology and codes 3010, 4555, and 7005.

V820 Parasites of humans - general and miscellaneous

(Code added January 1, 1983)

Animals other than insects and other arthropods, helminths, protozoa) as human parasites: includes leeches and other miscellaneous parasites

Etiology, pathology, therapeutics, control, and prevention of diseases caused by human parasites

Biology of parasites

Parasite control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control)

Parasite surveys

Immunity; human resistance to parasites

Zoonoses maintained in nature by man (double index to L820)

For:

*insects and other arthropod parasites of humans, use V821
*helminths of humans, use v822
*protozoa of humans, use V823

Strategy Considerations: Human parasitology has only recently been included in the scope of the database. For earlier works use appropriate terminology and codes 3010 and 7005.

V821 Parasites of humans - insects and other arthropods

(Code added January 1, 1983)

Insects and other arthropods as human parasites

Insects and other arthropods as vectors of human parasitic diseases (double index to V822-V823)

Etiology, pathology, therapeutics, control, and prevention of diseases caused by insects and other arthropods

Biology of parasites

Parasite control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control)

Parasite surveys

Immunity; human resistance to parasites

Zoonoses maintained in nature by man (double index to L821)

Strategy Considerations: Human parasitology has only recently been included in the scope of the database. For earlier works use appropriate terminology and codes 3010, 4555, and 7005.

V822 Parasites of humans - helminths

(Code added January 1, 1983)

Helminths of humans

Helminths as vectors of human diseases

Animals as vectors of diseases caused by helminths (double index arthropod vectors to V821)

Etiology, pathology, therapeutics, control, and prevention of diseases caused by helminths

Biology of parasites

Parasite control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control)

Parasite surveys

Immunity; human resistance to parasites

Zoonoses maintained in nature by man (double index to L822)

Strategy Considerations: Human parasitology has only recently been included in the scope of the database. For earlier works use appropriate terminology and codes 3010, 4555, and 7005.

V823 Parasites of humans - protozoa

(Code added January 1, 1983)

Protozoa of humans

Animals as vectors of diseases caused by protozoa (double index arthropod vectors to V821)

Etiology, pathology, therapeutics, control, and prevention of diseases caused by protozoa

Biology of parasites

Parasite control materials, equipment, methods, and programs (including cultural, chemical, physical, mechanical, integrated, and biological control)

Parasite surveys

Immunity; human resistance to parasites

Zoonoses maintained in nature by man (double index to L823)

Strategy Considerations: Human parasitology has only recently been included in the scope of the database. For earlier works use appropriate terminology and codes 3010, 4555, and 7005.

W000 POLLUTION

Degradation or susceptibility to degradation of environmental factors by man's activities in agriculture, fisheries, or forestry

Pollution of the environment required for agriculture, fisheries, and forestry by natural phenomena or man's activities in other spheres

Air, soil, and water pollution; prevention and control

Pollutants, agricultural chemicals, distillation waste, industrial waste, radioactive contamination, radioactive waste, liquid waste, sewage, etc. affecting agriculture

Purification methods of gases, liquids, sewage, etc.: physical and mechanical treatment, chemical treatment processes, biological treatment relating to agriculture

Agricultural waste disposal

Legislative aspects of pollution control, add D500

For:

*disposal of waste on farm land, use J500
*feed contamination, use R200
*food contamination, use Q200
*pesticide residues, use H000
*public health aspects of foodstuffs, use Q200
*veterinary aspects of public health, use L800

Earlier Codes: (70-1) 55, 85; (72-79) 6505

X000 AUXILIARY DISCIPLINES

Use only for works of a very general, all-encompassing nature, e.g. GENERAL: almanacs, biographies, encyclopedias, language dictionaries, newspapers, reference materials

All subject-related works should be indexed to the specific area, not here; e.g.

For:

*general agricultural encyclopedias, use A000
*general forestry dictionaries, use K000
*biography of animal scientists, use L000

INDEXERS: do not use this code

X100 Mathematics and statistics

Works on mathematics and statistical methods and theory applicable within the scope

Economic models, add E100

Farm models, add E200

Economic trade models, add E700

For:

*statistical data on specific subject matters, use appropriate subject headings

Earlier Codes: (70-1) 90; (72-9) 1025, 7505

X200 Documentation

Works on documentation, library work, and information science applicable within the scope

Data bases: bibliographical and hard data

Earlier Codes: (70-1) 90; (72-9) 9705

X300 Life sciences

Earlier Codes: (70-1) 50; (72-9) 7005

X380 Human medicine, health and safety

(Code added January 1, 1983; earlier, consider searching X300)

General medicine, health and safety (occupational and industrial) issues concening humans. Includes public health administration, communicable disease control, medical treatment for specific diseases, medical ethics. Includes occupational and industrial health issues caused by the processing of agricultural products (i.e. cotton dust, grain dust, etc.)

For:

*diet-related diseases and malnutrition, use T300
*human parasitic diseases, use V000-V823, as appropriate
*laws and legislation relating to occupational and industrial health issues, use D500
*research related to human physiology, use X300
*rural medical services, use E560
*veterinary medicine, use L800-L851, as appropriate
*zoonoses, use L800

Earlier Codes: (70-1) 50; (72-9) 7005

X400 Physical sciences

Earlier Codes: (70-1) 65; (72-9) 7505

X500 Chemistry

Earlier Codes: (70-1) 25; (72-9) 8005

X600 Technology

Earlier Codes: (70-1) 30; (72-9) 8505

X700 Economics and administration

Earlier Codes: (70-1) 75; (72-9) 9005

X800 Social sciences and humanities

Earlier Codes: (70-1) 75; (72-9) 9505

F. GEOGRAPHICS USED IN INDEXING PRACTICES

Abu Dhabi use United Arab Emirates
Abyssinia use Ethiopia
Aden use Yemen People's Democratic Republic
Adriatic Sea
Aegean Island use Greece
Agean Sea
Afars and Issas Territory use French Territory of Afars and Issas
Afghanistan
Africa
Africa South of Sahara
Agulhas Basin
Alabama
Alaska
Albania
Alberta
Algeria
America
American Samoa
Andaman and Nicobar Islands
Andhra Pradesh
Andorra
Angola
Anguilla use St Kitts-Nevis-Anguilla
Anhwei
Anjouan use Comoro Islands
Antigua
Antilles, Lesser use Lesser Antilles
Antilles (Netherlands) use Netherlands Antilles
Antarctica
Arab Countries
Arabian Sea

Note: These terms are not synonymous with geographics used for monographs.

Arafura Sea
Arctic Ocean
Arctic Regions
Argentina (was Argentine Republic)
Argentine Basin
Arizona
Arkansas
Armenian SSR
Aruba us Netherlands Antilles
Asia
Asiatic Turkey use Turkey-in-Asia
Asiatic USSR use USSR-in-Asia
Assam
Atlantic-Indian-Antarctic Basin
Atlantic Ocean
Australasia use Oceania
Australia
Australian Capital Territory
Austria
Azerbaidzhan SSR
Azores
Baffin Bay
Bahamas
Bahrain
Balearic Islands
Bali
Balkans
Baltic Sea
Bandunda use Zaire
Bangladesh
Barbados
Barents Sea
Barro Colorado Island
Basutoland use Lesotho
Bay of Bengal
Beaufort Sea
Bechuanaland use Botswana
Belgian Congo use Zaire
Belgium

Belitung
Belize use British Honduras
Belorussiya use Byelorussian SSR
Benelux
Bering Sea
Bermuda
Bhutan
Bihar
Billiton use Belitung
Bismark Archipelago
Black Sea
Bolivia
Bonaire
Borneo
Botswana
Bougainville
Brazil
Brazilian Basin
British Columbia
British Guiana use Guyana
British Honduras
British Indian Ocean Territory
British Isles
British North Borneo use Malaysia
British Soloman Islands
British Somaliland use Somali Republic
British Virgin Islands use Tortola
Brunei (was Borneo)
Bulgaria
Burma
Burundi
Byelorussian SSR
Caicos use Turks and Caicos Islands
California
Cambodia use Khmer
Cameroon (was Cameroun)
Canada
Canary Islands
Canton and Enderbury Islands
Cape Basin use Walvis Basin
Cape Verde Basin
Cape Verde Islands
Caribbean
Caribbean Sea
Carifta
Caroline Basin
Caroline Islands
Cayman Brac use Cayman Islands
Cayman Islands
Celebes
Central Africa
Central African Republic
Central America
Central Europe
Ceylon use Sri Lanka
Chad
Channel Islands
Chekiang
Chile
Chile Basin
China People's Republic
China (Taiwan) use Taiwan
Christmas Islands (Indian Ocean)
Christmas Islands (Pacific Ocean) use Gilbert and Ellice Islands
Chukchi Sea
Cocos Islands
Colombia
Colorado
Comoro Islands
Congo (Brazzaville) use Congo
Congo (Kinshasa) use Zaire
Congo (Leopoldville) use Zaire
Congo Democratic Republic use Zaire
Congo Orientale use Zaire
Connecticut
Cook Islands
Coral Sea
Corsica
Costa Rica
Cuba

Curacao
Cyprus
Czechoslovakia (was Czechoslovak Republic)
Dahomey
Delaware
Denmark
District of Columbia
Djawa use Java
Dominica
Dominican Republic
Dubai
Dutch Guiana use Surinam
East Africa
East Africa Protectorate use Kenya
East China Sea
East Indies use Indonesia
East Pakistan use Bangladesh
East Siberian Sea
Eastern Europe
Eastern Indian-Antarctic Basin
Ecuador
Egypt
Eire use Ireland
El Salvador
Enderbury Island use Canton and Enderbury Islands
England
Equateur use Zaire
Equatorial Guinea
Estonian SSR
Ethiopia
Eurasia
Europe
European Turkey use Turkey-in-Europe
European USSR use USSR-in-Europe
Falkland Islands
Far East
Fawe Islands
Fernando Po use Equatorial Guinea
Fiji
Fiji Basin
Finland
Flores
Florida
Formosa use Taiwan
France
French Guiana
French Polynesia
French Somaliland use French Territory of Afars and Issas
French Sudan use Mali
French Territory of Afars and Issas
French Togoland use Togo
French West Indies
Friendly Islands use Tonga
Frisian Islands
Fujairah
Fukien
Gabon
Galapagos Islands
Gambia
Georgia
Georgian SSR
German East Africa use Tanzania
Germany (Democratic Republic)
Germany (Federal Republic)
Ghana
Gibraltar
Gilbert and Ellice Islands
Goa, Daman and Diu
Gold Coast use Ghana
Grand Cayman Island use Cayman Islands
Grande Comore use Comoro Islands
Great Basin and Pacific Slope States
Great Britain
Greece
Greenland
Greenland Sea
Grenada
Gruziya use Georgian SSR
Guadalcanal use British

Solomon Islands
Guadeloupe
Guam
Guatemala
Guianas
Guinea
Guinea Basin
Gujarat
Gulf of Aden
Gulf of Mexico
Guyana
Haiti
Haryana
Hawaii
Heilungkiang
Hensi
Hervey Islands use Cook Islands
Himachal Pradesh
Holland use Netherlands
Holy See use Vatican
Honan
Honduras
Honduras (British) use British Honduras
Hong Kong
Hopei
Hudson Bay
Hunan
Hungary
Hupei
Iceland
Idaho
Illinois
India
Indian Ocean
Indiana
Indochina
Indonesia
Inner Mongolia
Iowa
Iran
Iraq
Ireland
Ireland, Northern use Northern Ireland
Irian Barat use West Irian
Irish Republic use Ireland
Isle of Man
Israel
Italian Somaliland use Somali Republic
Italy
Ivory Coast
Jamaica
Jammu and Kashmir
Jan Mayen
Japan
Java
Jordan
Jugoslavia use Yugoslavia
Kalimantan
Kamaran Island use Yemen People's Democratic Republic
Kansas
Kansu
Kara Sea
Kasai use Zaire
Kashmir use Jammu and Kashmir
Katanga use Zaire
Kazakh SSR
Kazakhstan use Kazakh SSR
Kentucky
Kenya
Kerala
Kerguelen Basin
Khmer
Kiangsi
Kiangsu
Kinshasa use Zaire
Kirin
Kirgiz SSR
Kivu use Zaire
Korea Democratic People's Republic
Korea Republic
Kurile Islands
Kuwait
Kwangsi Chuang
Kwangtung
Kweichow
Labrador
Laccadive, Minicoy and Amindivi Islands

Laos
Laptev Sea
Latin America
Latvian SSR
Lebanon
Leeward Islands
Lesotho
Lesser Antilles
Liaoning
Liberia
Libya
Libyan Arab Republic use Libya
Liechtenstein
Lithuanian SSR
Little Cayman use Cayman Islands
Louisiana
Luxembourg
Macao Macau use Macao
Madagascar use Malagasy Republic
Madeira
Madhya Pradesh
Madura
Maharashtra
Maine
Malagasy Republic
Malawi
Malaya use Malaysia
Malaysia
Maldives
Mali
Malta
Maluku use Moluccas
Manipur
Manitoba
Mariana Islands
Marquesas Islands
Marshall Islands
Martinique
Maryland
Mascarene Basin
Mascarene Islands
Massachusetts
Mauritania
Mauritius
Mauritius Basin
Mayotte use Comoro Islands
Mediterranean Region
Mediterranean Sea
Melanesia
Mexico
Michigan
Micronesia
Mid-Indian Basin
Middle Congo use Congo
Middle East
Midway Islands
Minnesota
Mississippi
Missouri
Moheli use Comoro Islands
Moldavian SSR
Moluccas
Monaco
Mongolian People's Republic
Montana
Montserrat
Morocco
Mozambique use Portuguese East Africa
Muscat and Oman use Oman
Mysore
Nagaland
Namibia
Natal Basin
Nauru
Near East use Middle East
Nebraska
Nepal
Netherlands
Netherlands Antilles
Netherlands East Indies use Indonesia
Nevada
Nevis use St Kits-Nevis-Anguilla
New Brunswick
New Caledonia
New England
New Guinea use Papua and New Guinea
New Hampsi hire
New Hebrides

New Jersey
New Mexico
New South Wales
New York
New Zealand
Newfoundland
Nicaragua
Nicobar Islands use Andaman and Nicobar Islands
Niger
Nigeria
Ningsiahui
Niue
Norfolk Island
North Africa
North America
North Atlantic
North Australian Basin
North Borneo use Malaysia
North Carolina
North Central States (USA)
North Dakota
North Eastern Atlantic
North Eastern Atlantic Basin
North Eastern Pacific
North Eastern States (USA)
North Korea use Korea Democratic People's Republic
North Pacific
North Sea
North Vietnam use Vietnam Democratic Republic
North West Territories
North Western Atlantic
North Western Atlantic Basin
North Western Pacific
Northern Ireland
Northern Rhodesia use Zambia
Northern Territory
Norway
Norwegian Sea
Nova Scotia
Nyasaland use Malawi
Ocean Island use Gilbert and Elliice Islands
Oceania
Ohio
Oklahoma
Oman
Ontario
Oregon
Orissa
Pacific-Antarctic Basin
Pacific Islands
Pacific Islands (Aus)
Pacific Islands (Fr)
Pacific Islands (NZ)
Pacific Islands (UK)
Pacific Islands (USA)
Pacific Islands Trust Territory use Trust Territory of Pacific Islands
Pacific Ocean
Pacific Slope States use Great Basin and Pacific Slope States
Pakistan
Palestine use Israel
Panama
Panama Canal Zone
Papua and New Guinea
Paraguay
Pennsylvania
People's Democratic Republic of Yemen use Yemen People's Democratic Republic
People's Republic of China use China People's Republic
People's Republic of Mongolia use Mongolia
Persia use Iran
Persian Gulf
Peru
Peru BAsin
Philippine Islands
Philippine Sea
Phoenix Island use Gilbert and Ellice Islands

Pitcairn Island
Poland
Polynesia
Porto Rico use Puerto Rico
Portugal
Portuguese East Africa
Portuguese Guinea
Portuguese Timor
Portuguese West Africa
Prince Edward Island
Principe use Sao Tome and Principe
Puerto Rico
Punjab
Qatar
Quebec
Queensland
Rajasthan
Ras al Khaimah
Red Sea
Reunion
Rhode Island
Rhodesia
Rio de Cro use Spanish Sahara
Rio Muni use Equatorial Guinea
Romania
Ruanda-Urundi use Burundi
Rumania use Romania
Rwanda
Ryukyu Islands
Saba
Sabah
Saint Helena
Sakhalin Island
Samoa, American use American Samoa
Samoa Islands
Samoa, Western use Western Samoa
San Marino
San Thome and Principe use Sao Tome and Principe
Santa Cruz Islands use British Solomon Islands
Sao Tome and Principe
Sarawak
Sardinia
Sargasso Sea
Saskatchewan
Saudi Arabia
Scandinavia
Scotia Sea
Scotland
Sea of Japan
Sea of Okhotsk
Senegal
Seychelles
Shanghai
Shansi
Shantung
Sarajah
Siam use Thailand
Sicily
Sierra Leone
Sierra Leone Basin
Sikkim
Singapore
Sinkiang-Uigur
Society Islands
Socotra
Solomon Islands use British Solomon Islands
Somali Basin
Somali Republic
Somali Democratic Republic
Somalia use Somali Democratic Republic
South Africa
South America
South Atlantic
South Australia
South Australian Basin
South Carolina
South Central States (USA)
South China Sea
South Dakota
South East Asia
South East Indian Basin
South Eastern Atlantic
South Eastern Atlantic Basin
South Eastern Pacific
South Eastern States (us)
South Georgia use Falkland

Islands
South Korea use Korea Republic
South Pacific
South Sandwich Islands use Falkland Islands
South Vietnam use Vietnam Republic
South West Africa use Namibia
South Western Atlantic
South Western Pacific
South Western Pacific Basin
Southeast Asia use South East Asia
Southern Africa
Southern Ocean
Southern Yemen use Yemen People's Democratic Republic
Soviet Union use USSR
Spain
Spanish Guinea use Equatorial Guinea
Spanish Sahara
Spanish Territories of North Africa
Spanish West Africa use Spanish Sahara
Spitzbergen use Svalbard
Sri Lanka (was Ceylon)
St Eustatius
St Helena
St Kitts-Nevis-Anguilla
St Lucia
St Maarten
St Pierre and Miquelon
St Vincent
Straits Settlements use Singapore
Sudan
Sulawesi use Celebes
Sumatera use Sumatra
Sumatra
Surinam
Svalbard
Swaziland
Sweden
Switzerland
Syria
Syrian Arab Repbulic use Syria
Szechwan
Tadzhik SSR
Tahiti
Taiwan
Tamil Nadu
Tanganyika use Tanzania
Tanzania
Tasman Sea
Tasmania
Tennessee
Texas
Thailand
Tibet
Timor
Timor Sea
Tobago use Trinidad and Tobago
Togo
Tokelau Islands
Tonga
Tortola
Transjordan use Jordan
Trinidad use Trinidad and Tobago
Trinidad and Tobago
Tripura
Tropical Africa
Tropical America
Tropical Asia
Tropical Oceania
Tropical Zone use Tropics
Tropics
Trucial States use United Arab Emirates
Trust Territory of Pacific Islands
Tsinghai
Tuamotu Archipelago
Tubai Islands
Tunisia
Turkey
Turkey-in-Asia
Turkmen SSR

Turks and Caicos Islands
Thyrrehenian Sea
Uganda
UK use United Kingdom
Ukranian SSR
Umm al Qaiwain
Umm Said use Qatar
Union of South Africa use South Africa
Union of Soviet Socialist Republics use USSR
United Arab Emirates
United Arab Republic use Egypt
United Kingdom
United States
Upper Volta
Uruguay
USSR
USSR-in-Asia
USSR-in-Europe
Utah
Uttar Pradesh
Uzbek SSR
Uzbekistan use Uzbek SSR
Vatican
Venezuela
Vermont
Victoria
Vietnam Democratic Republic
Vietnam Republic
Virgin Islands (British) use Tortola
Virgin Islands (USA)
Virginia
Wake Island
Wales
Wallis and Futuna Islands
Walvis Basin
Washington
Washington DC use District of Columbia
Wendell Sea
West Africa
West Australian Basin
West Bengal
West Indies
West Indies (French) use French West Indies
West Irian
West Pakistan use Pakistan
West Virginia
Western Australia
Western Europe
Western Samoa
Western States (USA)
Windward Islands
Wisconsin
Wyoming
Yellow Sea
Yemen People's Democratic Republic
Yemen Arab Republic
Yugoslavia
Yukon Territory
Yunnan
Zaire
Zambia
Zanzibar use Tanzania

G. LANGUAGE DESCRIPTORS

LANGUAGE ABBREVIATIONS
MARC Standard

(AFR)	Afrikaans [AF]*	(RUM)	Rumanian [RO]
(ALB)	Albanian [AB]	(RUS)	Russian [RS]
(ARM)	Armenian [AR]	(SCC)	Serbo-Croatian (Cyrillic)
(AZE)	Azerbaijani [AZ]	(SCR)	Serbo-Croatian (Roman)
(BEL)	Belorussian [BE]	(SER)	Serbian [SE]**
(BUL)	Bulgarian [BU]	(SLO)	Slovak [SL]
(BUR)	Burmese [BV]	(SLV)	Slovenian [SN]
(CHI)	Chinese [CH]	(SPA)	Spanish [SP]
(CRO)	Croatian [CR]**	(SWE)	Swedish [SS]
(CZE)	Czech [CZ]	(THA)	Thai [TH]
(DAN)	Danish [DA]	(TUR)	Turkish [TK]
(DUT)	Dutch [NE]	(UKR)	Ukrainian [UK]
(EST)	Estonian [ES]	(MUL)	Multilingual
(FIN)	Finnish [FI]		
(FRE)	French [FR]		
(GEO)	Georgian [GR]		
(GER)	German [GE]		
(GRE)	Greek [GK]		
(HEB)	Hebrew [HE]		
(HUN)	Hungarian [HU]		
(ICE)	Icelandic [IC]		
(IND)	Indonesian [ID]		
(ITA)	Italian [IT]		
(JPN)	Japanese [JA]***		
(KOR)	Korean [KO]		
(LAT)	Latin [KZ]		
(LAV)	Latvian [LA]		
(LIT)	Lithuanian [LI]		
(MAC)	Macedonian [LU]		
(NOR)	Norwegian [NO]		
(POL)	Polish [PO]		
(POR)	Portuguese [PT]		

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*BRS two-digit searching code

** Changed at end of 1976; see SCC and SCR

***JAP changed to JPN 4/15/74

SECTION III

DIALOG SEARCHING

AGRICOLA ON DIALOG

The CAIN database was one of the first offerings on the DIALOG system in the early 1970's. The original database was added to until 1979 when major processing changes at NAL resulted in the creation of database records that were substantially different in format from those in the existing file. DIALOG staff at that time decided to split the AGRICOLA database into two files. They closed the database at the end of 1978 and moved the records covering input between 1970 and 1978 into file 110. A newly designed file 10, containing records created since the beginning of 1979, was then opened.

The database design for file 10 has provided not only several new fields for searching but also a number of changes in the requirements for searching already existing fields. The sections which follow explain the fields in the AGRICOLA records in both of the DIALOG system files.

Accession Number

(10) AN=81023616 (110) RN=73-9066411

This field consists of unique identification numbers for citations in the AGRICOLA database since 1973. (Prior to 1973 the numbers were not unique.) The tag in file 110 consists of two digits denoting the year in which the item was entered into AGRICOLA, followed by a seven-digit number for that particular item, for example, RN=74-9066411.

In file 10 the identification tag (AN=) follows the same format as in file 110 minus the hyphen between the year and the record number. With the exception of some records entered during 1979, the numbers in file 10 provide access to unique documents. In 1979, however, a group of supplementary records were created for the database; many of these record numbers duplicated record numbers already in the file. A search on a 1979 record number will very likely , therefore, retrieve more than one document.

Author

(10) AU=SMITH, D.T. (110) AU=SMITH, D T

Only personal authors, editors, or compilers will be found in this field. Corporate authors are part of the Basic Index of file 110 in the /CS field and a part of the CS= field in file 10. Personal names in cataloging records will be established according to standard Anglo-American catalog practice. Treatment of authors' names in indexing records and in the records of some of the subfiles has varied over the history of the database. In file 110, indexing records and AAEDC records after early 1977 treat authors' names as last name followed by a comma, a space, and then initials separated by a space and no periods (for example, AU=LITTLE, E L). If there is another initial or other name distinctions such as "Jr," "Sr," "III," or similar distinctions, that element is added after another space, for example, AU=LITTLE, E L JR. FNIC records and the earlier AAEDC citations frequently contain an author's full name as it appears in the publication.

Indexing records in file 10 use periods following the initials and no space between the initials, for example, AU=BROWN, R.G. Changes resulting from the adoption of the second edition of Anglo-American Cataloging Rules will affect the form of some names used in cataloging records, but the overall effect in the database will be minimal.

Because of the significant variations in the way names have been handled in the database, one should always use the EXPAND function of DIALOG and select names from the resulting display.

International Standard Book Number (ISBN)

(10) BN=00604687

This number allows searching of cataloging records for items to which an International Standard Book Number (ISBN) has been assigned. The ISBN, usually expressed with hyphens (for example, 0060-468-7), consists of a code denoting publisher and a unique number for the publication. For searching purposes hyphens have been omitted and the numbers entered as a continuous string.

Call Number

(10) CA=SB423.A6B3 (110) NO=100 M31R

The call numbers from cataloging before 1966 are entered with a space between the class and book number, for example, 389.8 SCH6. Library of Congress call numbers, in use since 1966, are entered without spaces except before the year as part of the call number, for example, RC620.A1N8 1973. Call numbers also include the format designators--TRANSL, FILM, FICHE, AV, and so on--as prefixes. To retrieve all citations in a given format, one needs only to enter either CA= (file 10) or NO= (file 110) plus the appropriate format descriptor. NO=TRANSL or CA=TRANSL , for example, will retrieve the items that have been cataloged for the NAL collection of specially commissioned translations.

Since 1953, USDA publications have been cataloged with an "A" prefixed to the classification number (for example, A50.9 R31). Rare books have a prefix of an "R" with a space (R S176.R4 1657); folio books,"FO" or "FOLIO"; maps "MAP"; and Bee Culture Library holdings, "BEE" or "BEE CULTURE."

In file 110 call numbers will occasionally be displayed in format 3 (bibliographic citation) with the last digit dropped off. The problem does not occur in full display formats, and searching capabilities are not affected. Users who plan to use the call numbers in AGRICOLA records, therefore, need to choose either format 2 or format 5 for displaying records.

Conference Location

(10) CL=BELTSVILLE

This field contains the names of sites of conferences and symposia. Although one will find some multiword entries in the file (CL=NEW ORLEANS, for example), the most effective method for searching this field is with fulltext techniques, prefixing each part of the search request with the designator CL=. Thus, while "SELECT CL=NEW ORLEANS" may yield 15 citations, the command "SELECT CL=NEW(W)CL=ORLEANS" produces 28 citations, including those posted to the multiword entry.

Contract Number

(10) CN=GM 22525

Among the notes added to cataloging records is the contract number under which the publication was prepared. Numbers for contracts exhibit a wide variety of formats. Using the EXPAND command on the CN= field is, therefore, recommended before searching for contract numbers. Bear in mind when EXPANDing on contract numbers that DIALOG's filing rules for letters, numbers, and non-alphanumeric characters may place some contract numbers out of the sequence most users might expect. For example, contract number XYZ18844 will appear in the index before contract number XYZ19 because DIALOG files according to the magnitude of each character rather than the magnitude of an entire number.

Coden

(10) CO=CMFBD3

Since 1979 CODEN for journal titles have been added to database records. CODEN are standardized alphabetic or alphanumeric codes designed to ease the problem of variations in journal titles. These codes can be found in tools such as CODEN for Periodical Titles (Philadelphia: American Society for Testing and Materials, 1966, with supplements).

Conference Title

(10) CT=COTTON(W)CT=GENETICS

Indexing records created for papers that appear in conference proceedings contain the full name of the conference. Individual words in the conference title, each prefixed by CT=, can be searched using normal full text searching techniques. Thus, in order to search for papers from the Symposium on Bovine Reproduction, one would enter: SELECT CT=SYMPOSIUM(1W)CT=BOVINE(W)CT=REPRODUCTION.

Conference Year

(10) CY=1979

The CY= field contains either the year a conference was held or other ordinal designators (2d, 25th, etc.) for conferences which have been held more than once. EXPANDing on this field before SELECTing terms is highly advised since there are many variations among entries.

Corporate Source

(10)
CS=UNITED(W)CS=NATIONS (110) UNITED(W)NATIONS/CS

This field includes single words from the names of corporate authors and from corporate entities issuing publications, particularly units of USDA, FAO, and many state agricultural extension services and experiment stations. The name authority for the proper bibliographic entry for corporate bodies is the library's Corporate Entry Authority File (CEAF); if not found there, the entry is transcribed as it appears on the piece being indexed.

This field is part of the Basic Index in file 110, searchable with full text searching techniques just as words in titles, descriptors, and abstracts. In file 10 the Corporate Source field has been taken out of the Basic Index and been made a prefixed field with the tag CS=. Full text searching techniques can, however, be used on this field as well, but each word must be preceded by the CS= tag (for example, SELECT CS=NORTH(W)CS=DAKOTA).

Remember, stop words cannot be used for searching, but they must be counted if the user employs the full text technique to locate a corporate source. To illustrate, a user trying to locate publications by the Agency for International Development cannot use the word "for" as part of a SELECT command since it is a stop word, that is, a word too frequently used for the DIALOG system to use in a search statement. The user must, however, count it in formulating a command for full text searching. The proper form of a search command would be

SELECT AGENCY(1W)INTERNATIONAL(W)DEVELOPMENT/CS (110)

or

SELECT CS=AGENCY(1W)CS=INTERNATIONAL(W)CS=DEVELOPMENT (10)

where the "1W" indicates that up to one word may be present between the words "agency" and "international."

Since the Corporate Source field can be searched only by single words, a searcher trying to retrieve a comprehensive group of documents from a department of government or some other organization should expect to use several variations in order to accomplish the task. Both "California" and "Calif," for example, would be reasonable alternatives in a search for publications by organizations such as the California Department of Food and Agriculture or the California Board of Forestry.

Document Type

(10) DT=BIBLIOGRAPHY (110) DT=BIB

The DT= field has been modified and expanded substantially in file 10. The abbreviated forms DT=BIB and DT=TRANSL in file 110 have been spelled out in file 10, and document type tags have been added for several dozen media formats (for example, motion pictures, posters, etc.). Most of the media materials are Food and Nutrition Information Center items. There are six types of print format documents that are specifically tagged for retrieval in the database:

1. DT=MONOGRAPH. Cataloging records for a monograph, a separately cataloged monograph in a series, or an analytic of a monograph in a series are tagged with this designator. The item itself may be anything from a 2-page leaflet to a multivolume work.

2. DT=SERIES. Cataloging records for items in a numbered series and for other serials (open entries) are designated as SERIES. The record will be in the AGRICOLA database only if the serial title has been cataloged by NAL since 1970.

3. DT=BIB (file 110) or DT=BIBLIOGRAPHY (file 10). This designation has been used since February 1974 to tag any publication with three or more full size pages of bibliography.

4. DT=REVIEW. Tagging of review articles began in February 1975.

5. DT=TRANSL (file 110) or DT=TRANSLATION (file 10). This tag is used for a) articles indexed from journals which

are usually cover-to-cover translations, b) items from the NAL translation file, and c) articles which appear both in English and other languages. Articles with only summaries in English are not tagged as translations.

6. DT=ARTICLE. This tag is used by indexers both for journal articles and for individual papers appearing in collective works. Postings for this entry are too large to allow searching on DT=ARTICLE. The technique to be followed in order to isolate articles is to use NOT logic. For example, the statement SELECT TOMATOES NOT DT=MONOGRAPH NOT DT=SERIES will result in the creation of a set of articles containing the word "tomatoes."

Edition

(10) ED=REVISED

Notes regarding the edition of a monograph are entered into the ED= field. Multiple word statements are searchable as individual words, each prefixed by ED= (for example, ED=SOUTH(W)ED=ASIAN(W)ED=EDITION). The form of entry terms is not standard, so it will be possible to find numerous forms for common entry terms (for example, ED=3RD, ED=3D, and ED=THIRD). EXPANDing is recommended when searching this field.

Geographic Location

(10) GL=OKLAHOMA or OKLAHOMA/DE (110) OKLAHOMA/DE

Geographic descriptors are added to records in which the location is significant. In file 10 the geographic descriptors are entered into the GL= field. Multi-word terms in this field are searchable both in their precoordinated form (for example, GL=NORTH DAKOTA) and as individual words (for example, GL=NEW(W)GL=ORLEANS). These terms will also be retrieved in the descriptor field. In file 110 geographic locations were noted only in the descriptor field. Such designators were not, however, added as frequently in file 110 as they are today.

Government Printing Office (GPO) Number

(10) GP=A 1.76-453/978

Cataloging records for publications distributed by the Government Printing Office contain the Superintendent of Documents classification number. The classification number consists of an alphabetic designator for the Government department or agency responsible for the publication (for example, "A" for USDA, "C" for Commerce Department, etc.), followed by a numeric or alphanumeric code denoting the specific work.

Government Source

(10) GS=STATE

The Government Source field contains designators for the type of government agency issuing the publication. The principal designators are AUTONOMOUS, FEDERAL, INTERNATIONAL, LOCAL, MULTILOCAL, STATE, and various United Nations and U.S. Government departments and agencies.

Holding Library

(10) HL=TXA

The OCLC library holding symbol is a part of records emanating from NAL cataloging and from monographic records input by units such as the Food and Nutrition Information Center. Lists explaining the three-character codes are available in many libraries throughout the country.

Journal Name

(10,110) JN=LIFE SCIENCES

This field contains a listing of journal names and journal title abbreviations following the rules of the American Standard for Periodical Title Abbreviations. The Journal Title Abbreviation File is frequently updated, and changes to journal title abbreviations occasionally result in entries for the same publication being separated alphabetically. Users should therefore use the EXPAND feature of the DIALOG system before searching on journal title abbreviations.

Another technique for overcoming the problem of variant title abbreviations is to identify the call number of the journal using one form of the journal name and then to conduct a full search of the file using the CA= (file 10) or NO= (file 110) fields. A set made from the call number will include all title variations of the journal, provided the item has not undergone a change requiring a modification of the call number.

Language

(10) LA=GERMAN (110) LA=GER

Three-letter tags are included for the language of each item in file 110. A complete list of the language abbreviations can be found in section II. Since 1979 the LA= field has contained the full name of the language. A problem has existed in the loading of some languages in file 10 (for example, Portuguese, Polish, Japanese, and Korean), so users will be well advised to approach limiting to these languages with some caution until the problem can be resolved.

Library of Congress Card Number

(10) LC=79018940

This field allows searching on the number used for identifying the catalog cards produced by the Library of Congress. This number uniquely identifies publications, and it is frequently used by libraries for ordering and to speed access to works via computer systems. In file 10 the number is searchable without hyphenation, although it is normally expressed in print with hyphens. This information is not a part of the records in file 10.

Publisher

(10) PU=FARM(W)PU=BUREAU

Individual words in the names of publishing concerns have been made searchable in the PU= field. Full text searching techniques can be applied in order to search on multiword names.

Publication Date

(10) PY=1983 (110) SY=1975, SM=197506, and SD=19750611

The date of publication is searchable in file 10 in the PY= field and in file 110 in three separate fields: Search Year (SY=), Search Month (SM=), and Search Date (SD=). Both PY= and SY= contain four-digit numbers. More specific levels of searching are provided for file 110. The SM= field contains six digits, the year followed by two digits for the month of publication (for example, SM=197609 for September, 1976). Exact publication dates can be searched as eight-digit numbers in the SD= field--the year, the month and the date (for example, SD=19760911 for September 11, 1976). Each of the more specific date fields in file 110 is subsumed by the broader fields; thus, all the items retrievable in the SD= field will also be retrieved in a search of the SM= or the SY= fields.

Series Statement

(10) SE=AGRICULTURAL (W) SE=HANDBOOK

Many publications are issued as part of a series. This fact is noted in cataloging records in a series statement. In file 110 this information displays as part of cataloging records, but it cannot be searched. The database redesign for file 10 has made the series statement searchable with full text searching techniques. Each word must be prefixed by SE=, as illustrated in example at the top of this entry.

Subfile

(10) SF=FNC (110) LO=FNC, SC=EXT

The subfile field, created for file 10, contains the tags for various types of publications for records created by a number of NAL units or other organizations, and for special program files. In file 110 this information was divided between two fields, LO= (Location) and SC= (Source Code). The values in the LO= field are three-letter codes for subject or organizational subfiles. The codes of principal value are the following:

AGC (Agriculture Canada's input to AGECON)
AGE (AAEDC's input to AGECON)
BEE (A small apiculture/sericulture file)

BRU (Brucellosis subfile)
DCB (Items at the NAL branch in Washington, D.C., principally social sciences)
ENV (Environmental Impact Statements)
FNC (Food and Nutrition Information Center)

The source codes in file 110 are as follows:

EXP STN (State experiment station publications)
EXT (State extension service publications)
FAO (Food and Agriculture Organization of the U.N.)
OTHER US (Non-USDA US publications)
USDA (USDA publications)

The subfile field in file 10 must be approached somewhat more carefully. It contains basically the same tags as the LO= and SC= fields in file 110, but several of the SF= entries have had explanatory phrases added. Since this is a formatted field, every character to the right of the equals sign is significant. Consequently, searchers should routinely search the SF= field with truncation. One should, for example, search for USDA publications by entering SF=USDA? in order to retrieve not only entries where the value is simply "USDA" but also entries where the value is "USDA (US DEPT. AGR)."

In addition to file 110 values, the SF= field contains tags for newly created subfiles, among which are the following:

ADU (Adult extension materials)
ENE (Energy in Agriculture, extended)
ENR (Energy in Agriculture)
4-H (4-H materials)
OTHER FOREIGN (Non-US publications)
PAR (Parasitology subfile)

Section Heading Code

(10) SH=N200 (110) CC=1050, OC=35

The coded equivalents to the major subject sections of the Bibliography of Agriculture and the Catalog of the National Agricultural Library are searchable in both files. In file 10 the field is SH= and in file 110 it is the fields CC= (Category Code) and OC= (Old Code). The OC= field contains two-digit codes corresponding to the broad categories used in the printed tools through 1971. The CC= field contains the four-digit codes introduced in 1972 and used throughout the rest of the time

included in file 110. With the redesign of the database for file 10, the prefix was changed to SH=. During 1979 the four-digit codes used in file 110 continued in effect. Alphanumeric codes were introduced in 1980.

Because both the code prefixes and the code values themselves have changed several times throughout the history of the database, users should be especially careful in using subject codes as part of search strategies. Use of a code automatically limits the list of retrieved items to the time period during which that code was employed. Searchers should, therefore, plan strategies that include codes and/or appropriate search terms which will cover the entire time period covered by the file being queried. In some cases there will be exact equivalents in both the four-digit and the alphanumeric code schemes. In other instances, however, coverage of subjects among the code schemes varies so much that better results will be obtained by the use of a word search.

International Standard Serial Number

(10) SN=0567-5731

The International Standard Serial Number (ISSN) is a number uniquely identifying periodicals and other serial publications. Where the ISSN is known, it is added to cataloging records for new serial titles and to indexing records as well. The journal title abbreviation and call number fields, however, should still be preferred for journal searching throughout the entire database.

Sponsoring Agency

(10) SP=STANFORD(W)SP=UNIVERSITY

Individual words in the name of sponsoring agencies are searchable with the SP= prefix. This field typically appears in the records for conference or report literature. Searchers should be particularly mindful of common abbreviations such as "UNIV" or "DEPT" when searching in this field.

Update

(10) UD=8301 (110) UD=7806 or JA=7402

This field consists of the last two digits of the year plus a two-digit designator for the month. Coupling a subject search

with appropriate update numbers allows the user to limit search output to specific months of the AGRICOLA database. The most recent database update is entered twice--once with its proper year-month designation and once with the designation 9999. Thus, a user who does not remember the latest update number can simply enter SELECT UD=9999 and automatically get postings for the latest update. This field was called JA= (Journal Announcement) during 1973 and part of 1974.

DIALOG BASIC INDEX

The fields making up the Basic Index represent the most frequently searched portions of the AGRICOLA database. If no field retrieval code is specified in an EXPAND or SELECT command, the DIALOG system will default to this index. Thus, SELECT FIELD will create a set with the term FIELD appearing in a title, an abstract, a descriptor, the name of a corporate source (110), a cataloging note (10), or in a section heading (10). Personal authors with the last name FIELD would not be searched by such a command.

Terms in the Basic Index may be either individual words or indexing phrases. Whether one should search individual terms or precoordinated phrases depends on which portion of the Basic Index is being queried. The content and structure of the various subparts of the Basic Index are explained below.

Abstract

(10,110) EATING(W)HABITS/AB

The abstract field includes single-word terms from abstracts. At the present time only the AAEDC and the FNIC subfiles contain sizable numbers of abstracts, although some subfiles such as ADU do contain brief annotations. The differences in specificity of usage between words employed in titles and the same words appearing in abstracts may occasionally pose problems in the search and produce numerous false positives. To eliminate words in the abstract field from a search if they are yielding irrelevant references, select terms with limiters other than /AB. For example, SELECT ECONOMICS/TI,DE will create a set containing the word ECONOMICS only as it occurs in the title or descriptor fields.

Corporate Source

See prefixed field CS=.

Descriptor

(10,110) FARM(W)CREDIT/DE or FARM CREDIT

This field includes the subject heading assigned to monographs, geographic descriptors assigned to articles, and the subject headings assigned to material indexed or cataloged by units such as the Food and Nutrition Information Center, and the American Agricultural Economics Documentation Center. NAL used its own subject headings for monographs through June 1972. Since July 1972 Library of Congress subject headings have been used in cataloging records. In 1973 the Indexing Section began using political geographic descriptors, and in 1975 started expanding the list and changing some headings in order to be compatible with the AGRIS and MARC geographics. See section II-F for a list of geographic descriptors.

Users particularly interested in the FNIC, and AGECON subfiles should write these centers for information regarding their subject heading lists. Subject descriptors for essentially the same thing or concept may differ in the database because of the vocabulary authority employed by the unit creating the record. For example, FNIC uses for vitamin A the direct heading VITAMIN A, while the old NAL system heading was VITAMINS (A), and there is no specific heading for vitamin A in the Library of Congress subject headings list.

Descriptors are in the Basic Index both in their bound, precoordinated form and as individual words. Thus, one may search for CONSUMER EDUCATION as a two-word descriptor or as the separate terms using DIALOG's full text searching technique, for example, CONSUMER(W)EDUCATION. Entering the precoordinated two-word phrase will automatically limit retrieval to the descriptor field, while entering the individual terms linked with the positional operator (W) will retrieve that sequence of words from any field of the Basic Index.

Notes

(10) MAP/NT

Explanatory notes are occasionally added to cataloging records. The notes are searched as part of the Basic Index in file 10 records only. They will appear in a full display of file 110 records, but they cannot be searched.

Section Headings

(10) FARM EQUIPMENT/SH or FARM(W)EQUIPMENT/SH

Since 1979 the word equivalents of subject heading codes have been made searchable. Although this feature greatly increases the searcher's ability to search for broad headings, it will also create several problems in retrieval. Inclusion of the word "breeding" in a strategy, for example, will retrieve all references in which that term appears in the headings "Plant Genetics and Breeding" and "Livestock Breeding." Without a carefully constructed strategy to weed out unwanted materials from the "breeding" references, the end result of the search will contain an unusually high number of irrelevant citations.

Title

(10,110) PLANT(W)MIGRATIONS/TI

This field includes all single words (except for 12 stop words) appearing in titles of articles and monographs. Foreign language title words in the Roman alphabet and their English translations are included in this field. Because the terms in this field are essentially free text words, users will need to make sure that they have selected all possible variants of useful terms that might appear in titles. British spellings, for instance, would be potential trouble spots in title word searches, as would adjectival and adverbial forms of relevant nouns--for example, "hormone," "hormonal," "hormonally," and similar forms.

The practice of title word enrichment can also create a number of problems for searchers. Until recently the practice followed by indexers was to add enrichment terms at the point in the title where an ambiguous term appeared. Thus, in a title such as "Management Practices to Increase Crop Yields," the indexer might choose to enrich both the concepts of management practices and crops. The appropriate terms would then be added to the title so

that it would appear in the database as "Management Practices (Irrigation, Tillage) to Increase Crop (Wheat, Sorghum) Yield." While such interpolations into the title would improve the information value of the title, their presence in the word stream of the original title would make very difficult the task of the searcher who was trying to verify publication information about that paper if the only thing known was the original title of the article. The search statement SELECT MANAGEMENT(W)PRACTICES(1W)INCREASE(W)CROP/TI would not retrieve the item from the file because of the words "irrigation" and "tillage" added by the indexers. Because of this potential problem, the most effective approach to using the title field for verification is to use the field operator (F) rather than the positional operators (W, nW). By using the field operator, the searcher can specify that the words appear in the title together, but the exact sequence of terms is not dictated by the search statement.

SECTION IV
BIBLIOGRAPHIC RETRIEVAL SERVICE SEARCHING

AGRICOLA ON BRS

The AGRICOLA database is loaded on the Bibliographic Retrieval Service (BRS) system as a single file covering 1970 to the present. The major format changes introduced by NAL in 1979 have resulted in only minimal changes in the BRS file. The BRS version of the database enables the user to search AGRICOLA both with individual terms and with a variety of relational operators. The BRS system provides the usual AND, OR, and NOT logical operations plus four more functions:

SAME--Terms in the same data field or paragraph.
WITH--Terms in the same sentence.
ADJ--Terms adjacent and in the specfied orde..
XOR--Terms in an exclusive OR relation; that is, either one but not both.

In addition, the system gives the user the ability to "post-qualify" search statements to specific data fields. For example, a user may have created a general search statement on a concept such as harvest losses. He can create a new search statement in which those words appear in specific fields simply by referring to the previous statement number, specifying the desired fields. Those steps would look like this:

```
1_:  HARVEST$3 with LOSS$2 OR HARVEST-LOSS$2
RESULT     398

2_:  1.TI.
RESULT     263
```

The AGRICOLA record as it is formatted for searching on the BRS system consists of up to 15 different elements or paragraphs. These elements are summarized in the table and the sections which follow. Bear in mind that not all of the fields in the BRS version of the AGRICOLA record can be used to retrieve references; and others, such as language, can be used only in limiting subsets of the database which have been retrieved by use of other unit record paragraphs.

BRS RETRIEVAL CODE SUMMARY
(ø-Limit only, *-Display only)

CODE	DESCRIPTION	SAMPLE ENTRIES
AB	Abstract	SCHOOL ADJ LUNCH.AB.
AN+	Accession number	AN 77003865
AU	Authors (both individuals and organizations)	JONES ADJ E ADJ F JACKSON ADJ SAMUEL ADJ R ROHM WITH HAAS.AU.
CC	Category codes	(3010 L832).CC. AND CATTLE Houseplants and 10$2.CC.
CN	Call number	WIND AND HD9502$ SOIL and SB433586
DE	Descriptors	COMMODITY ADJ MARKETS.DE. FOOD ADJ PURCHASING.DE.
IN	Author affiliation	TEXAS WITH AGRICULTURAL.IN. UNITED ADJ NATIONS.IN.
LGø	Language of publication	..LIMIT/3 LG-EN ..L/3 LG-GE and YR > 76
NT+	Notes	NT SUMMARY IN ENGLISH
PTø	Publication type	..LIMIT/3 PT-M ..L/3 PT-J and YR-78
SNø	Source code or subfile	..LIMIT/6 SN-USD ..L/6 SN NE FNC
SO+	Source reference	SO BONSAI J. 9(1):14. SPRING 1975.
TI	TITLE	CITRUS WITH DISEASES1.TI.
TR	Foreign title or translated title (searchable, 1979-)	TR LA PROPAGATION DES FRAMBOISES BACTERIAS1 WITH CONTROL.TR.
YRø	Publication Year	..LIMIT/18 YR-77 ..L/21 YR WL 73,78

ABSTRACT AB

Individual words within the abstracts or annotations of some AGRICOLA records are searchable. At the present time most of the records with abstracts or annotations are in the subfiles FNC, AGE, AGC, and ADU. Naturally occurring punctuation, such as hyphens, is retained when the AGRICOLA records are loaded. Therefore, in order to insure complete retrieval on some concepts, one must use several alternative formulations. For example, to search for information on the Meals On Wheels program for the elderly, one should enter:

1-: MEALS ADJ WHEELS OR MEALS-ON-WHEELS

This statement would then retrieve references where "Meals on Wheels" appeared in the citation without punctuation or where it was written with hyphens. Note that in the unhyphenated form, the stopword "on" was excluded (MEALS ADJ WHEELS). In the BRS system, stopwords are not counted when formulating a word adjacency search statement.

ACCESSION NUMBER AN

Each record in the AGRICOLA database is assigned an eight-digit record number consisting of the two digits for the year in which the record was created plus six more digits identifying the record. This element cannot be used in formulating search strategies, but it can be useful to the searcher who must arbitrarily limit search results. By noting the first two digits in the accession numbers of records, one can judge how recent the information is at a particular point in a search printout and can then establish a cutoff point for the output.

AUTHORS AU

The names of both personal authors and corporate bodies are entered in this paragraph . Names are not bound together in a precoordinated form and must be searched as individual words, initials, or abbreviations. The format of personal names is always last name followed by a comma and either the full given names or initials; thus, George F. Zimmer could be represented in the database in the following manner:

ZIMMER, GEORGE FREDERICK
ZIMMER, G F
ZIMMER, GEORGE F

or ZIMMER, G FREDERICK

Each word or initial in a name is searchable, so in order to retrieve works by Zimmer, for example, one should enter:

ZIMMER ADJ (G OR GEORGE) ADJ (F OR FREDERICK)

This strategy will retrieve works by this author, regardless of the form of entry used for his name. Truncation on an author's given names will seldom work in BRS since the system must go to its Basic Index to retrieve all qualifying entries before it limits results to a particular field. So, a searcher who enters a statement such as ZIMMER ADJ G$.AU. will receive a message back from the system stating that greater than 100 index entries were found in the index and that only a small portion of those entries beginning with "G" had been processed.

The variability which exists in corporate names also necesitates a flexible search strategy. Thus, in order to be assured of retrieving publications by the California State Department of Health, as an example, one should use a strategy similar to this:

CALIF$ WITH (DEPARTMENT OR DEPT) WITH HEALTH.AU.

CATEGORY CODE CC

The indexers and catalogers who prepare records for AGRICOLA have assigned numeric or alphanumeric codes to each item. These codes are directly searchable and can often be valuable in putting lists of references into a desired context without the necessity of entering a long list of search terms. For example, TOMATO$2 AND (10$2 E1$2 E4$2 E7$2).CC. will retrieve a large percentage of the records in the database dealing with economic and marketing aspects of tomato crops. A number of different code schemes have been used throughout the history of the database. Consult section II-E for an explanation of these codes.

In using category codes the searcher needs to remember two things. First, the codes have been used for a large portion of the database as a means of organizing printed bibliographic tools into fairly broad sections. They were not applied in order to draw out very specific details. Second, some of the AGECON and FNIC category codes overlap NAL codes with slightly different meanings; so a searcher desiring to use only codes with FNIC's meanings, for example, should also LIMIT any direct search results to those tagged SN=FNC.

As a general cautionary note, one should also be particularly aware of the date limitations imposed on a search by category codes. The basic coding scheme has been changed completely three times since 1970. Therefore, a searcher who uses only the most recent code for a topic--J100 for Soil Biology, for example--is automatically limiting retrieval to those references entered into the database since 1980. The notes and cross references in section II-N should be studied carefully when codes are being selected for inclusion in search strategies.

CALL NUMBER CN

For most records in the AGRICOLA database the NAL call number is a searchable element. A few early records input by the University of California at Davis, some AGECON records, and a few other records will contain other call numbers or accession numbers in this field. The BRS system removes all punctuation from numbers in this field. Thus, in order to retrieve items with the call number SB433.5.B6, one will need to enter SB4335B6.CN. The missing decimals in classification numbers may occasionally pose a problem to the user wishing to use class numbers as subject parameters since, for instance, the distinction is lost between Z699.5 and Z6995. Such occurrences should, however, be rare.

More troublesome in call number searching is the limitation of the 100-term lookup in truncated search statements. A user who wants to do a broad search on the Library of Congress class SB, for instance, will experience great frustration in accomplishing this goal. The system will process only 100 index entries at a time, and since call numbers are designed to be unique designators, the number of records processed at one time out of a large LC class is very small. There is an additional consideration in searching for records from publications bearing old NAL classification numbers which were entered into AGRICOLA between 1979 and 1982. These records were entered in such a way that they must be searched using a positional connector between the classification number and any cutter numbers. Thus, one must search a number such as 100 T31 in two ways: "100T31" for records entered before 1979 and after 1982 and "100 adj T31" for any 1979-82 records. This inconsistent treatment does not appear to have affected call numbers in the Library of Congress system; they should all be searched as a continuous string of characters without any punctuation.

DESCRIPTORS DE

Any AGRICOLA records may have terms entered in the descriptor field. Records prepared by FNIC, AGECON, and the NAL Cataloging Section will always contain terms drawn from their controlled vocabulary authority lists. A few of the newer subfiles, such as Brucellosis, also, draw from special lists of indexing terms. Records created by the NAL Indexing Section may also contain geographic descriptors drawn from the list in section II-F of this manual. NAL indexers also note whether an item is a review article or contains a lengthy bibliography, and that information is placed in this paragraph of the BRS/AGRICOLA record. Descriptors can be searched only by individual words; so the searcher desiring the two-word descriptor CONSUMER BEHAVIOR would enter CONSUMER ADJ BEHAVIOR.DE.

Searchers should remember that while limiting a subject search statement to the descriptor field may reduce a large initial output, and increase relevance in the process, that technique is also usually excluding the great majority of records in the database, those created by the Indexing Section. Users should be aware that at present the BRS loading program includes only the first 10 descriptors in a citation. In the past this limitation posed no problem since records did not have more than that number of descriptors assigned. Some of the newer subfiles (ENV, BRU, PAR), however, do have extensive keyword lists that get truncated in the BRS system, thus increasing the likelihood that relevant items may be missed.

AUTHOR AFFILIATION IN

Many records created before 1979--particularly those for items sponsored, issued, or published by the U.S. Department of Agriculture, or the state experiment stations and extension services--will contain the author affiliation field. Because each word in this field is searchable, the searcher must remember to allow for the possibility of variant forms in names such as DEPARTMENT or DEPT. This field has not been poted since 1978, so one should use it only when searching for older records.

LANGUAGE LA

Each AGRICOLA record is tagged to indicate its language of publication. References identified via direct searching techniques can be further limited to specific languages with the LIMIT command as follows:

```
1-: TOMATO$ AND 10$2.CC.

RESULT                          170
2-: ..LIMIT/1 LG-EN

RESULT                          138
```

If foreign language items were desired, the searcher would enter:

```
2-: ..LIMIT/1 LG NE EN
(i.e. language not equal to English)
```

BRS has standardized all language designators in the system to two-character codes; these codes are indicated in brackets in the language code portion of the manual (section II-G).

NOTES NT

Many cataloging records and a few records from other units will contain informative notes. The type information to be found in this field ranges from references to substantial bibliographic lists to indications that the item contains a summary in another language. Although this element is printed as part of a full record, it cannot be searched as part of a retrieval strategy.

PUBLICATION TYPE PT

AGRICOLA records are tagged either as articles (J for 1970-78 or A for 1979 to date), monographs (M), or series (S). Search results from directly searchable fields can be narrowed to these document types with the LIMIT command. PT-J will retrieve references both to journal articles and to parts of larger works (for example, chapters from significant books or papers from published proceedings). PT-S will retrieve serial cataloging records and serial analytics done by the NAL Cataloging Section.

SOURCE NAME SN

Several types of publications can be identified with three-character codes via the LIMIT command. These codes are used to identify both items issued by particular groups and records in specific collections or subfiles. The codes are as follows:

Publication sources

USD USDA publications
EXP State agricultural experiment station publications
EXT State agricultural extension service publications
FAO Food and Agriculture Organization publications
666 Other U.S. publications (through 1978)
OTH Other U.S. and foreign publications (1979 to date)

Collection sources

ADU Adult Extension Service records
AGC AGECON records from Agriculture Canada
AGE AGECON records from AAEDC
BRU Brucellosis subfile records
ENE Energy in Agriculture (Extended)
ENR Energy in Agriculture
ENV Environmental Impact Statements
4-H 4-H subfile records
FNC Food and Nutrition Information Center records
PAR Parasitology literature collection
TRN NAL translation collection records

SOURCE REFERENCE SO

The source reference field in AGRICOLA records contains the bibliographic data needed to identify the item. For articles this field typically contains the journal name with volume, issue and page citations, or for monographic or serial cataloging records, this field contains imprint information. Prior to 1979 indexers at NAL also used this field to note English summaries accompanying foreign language items and to call attention to items with substantial lists of bibliographic references. The information in this field cannot be searched, although it will be printed out in a display of records.

TITLE TI

Each item in the AGRICOLA database will contain an English title, all significant words of which may be used in the search mode. Naturally occurring punctuation within titles, as in abstracts, has been retained by the BRS system and must be accounted for in search strategies. For example, a searcher who simply uses SOIL ADJ BORNE to identify items on organisms in the soil runs the risk of missing items in which that term may be hyphenated (for example, SOIL-BORNE). Because of changes in how foreign titles have been handled (see TR field note), users need to include TR as well as TI when limiting search terms to titles

of publications in the database.

FOREIGN TITLE TR

This field has been treated in two ways in AGRICOLA. From 1970 through 1978 the TR field was a "display only" field containing the original title for foreign language items in Roman alphabets. Since 1979 the field has contained the English translation of foreign titles, and the original title has been placed in the TI field. The TR field has been made searchable for records created since 1979.

YEAR OF PUBLICATION YR

Through use of the LIMIT command, a searcher can quickly narrow his search to items published during a specific year or range of years. Each of the LIMIT options can be employed with this field; for example, the following options:

```
..LIMIT/2 YR=79
..LIMIT/2 YR>78 (or YR GT 78)
..LIMIT/2 YR<76 (or YR LT 76)
..LIMIT/2 YR WL 77,80 (i.e. between limits)
```

V. File Selection and Additional Search Techniques for Agricultural Literature

A. Database Selection

Quite apart from problems associated with searching a database is the task of selecting the file or files to be searched. In agriculture and natural resources research, selecting databases can be especially difficult since many files overlap each other in their coverage of publications and subjects. As an illustration of this problem, table 1 shows the coverage in selected broad areas of three major files covering the agricultural field.

Subject	CAB*	AGRICOLA**	BIOSIS**
Agricultural Economics	76,553	149,978	--
Animal Breeding	75,699	53,309	8,520
Plant Breeding	116,943	59,498	41,490
Field Crops	97,025	98,179	58,750
Phytopathology	62,259	106,543	49,610
Weeds	40,417	26,123	6,410
Forestry	73,323	113,538	17,900
Horticulture	107,704	84,867	56,150
Soils and Fertilizers	85,939	108,932	69,170

*Based on postings in selected subfiles
**Based on postings in selected subject category codes
Table V-1. Coverage of selected areas by the Commonwealth Agricultural Bureaux databases, AGRICOLA, and BIOSIS

The table shows that in a few instances a database can be determined to be inappropriate for a subject, as in the case of

BIOSIS for agricultural economics. It also clearly illustrates that in many fields the coverage is strong in several databases.

There have been a number of studies done in the last decade comparing various databases for their coverage of agricultural topics. The general conclusion that can be drawn from these studies is that there is no clearly superior database for all agriculturally related search topics. The overlap among files such as CAB, BIOSIS, and AGRICOLA is (not surprisingly) substantial, but the percentage of unique records in each file is also significant (often as high as 40 per cent or greater).

Selecting the "best" database cannot be based, however, on the number of citations alone. The publications covered by a database, the timeliness of updating, and the amount and quality of indexing added to the citations must be considered heavily in choosing a file. While, for example, AGRICOLA, BIOSIS, and the CAB database can be expected to cover the core journals in a field such as phytopathology, each will contain references from scores of publications not covered by the other databases. AGRICOLA will be relatively stronger in its coverage of USDA and agricultural experiment station publications as well as general monographic works in the field. CAB will be generally stronger in British Commonwealth and non-U.S. publications, and BIOSIS can be expected to be stronger in sources covering methods and basic biological research related to the topic. Even in those instances where the databases index the same publications, one may choose a file such as AGRICOLA over one such as CAB because of its generally greater timeliness; or one might prefer BIOSIS to either AGRICOLA or CAB because of the level and quality of indexing available for the topic being searched.

With the obvious limitations duly noted, the database descriptions offered here are aimed to suggest files appropriate for agricultural and food research.

AGRICOLA, 1970 to date. All areas of agriculture covered; extensive coverage of plant science, entomology, forestry, soil science, animal production, and agricultural economics. Very strong in U.S. publications, especially from USDA agencies and land-grant universities. Nature and extent of indexing highly variable.

AQUACULTURE, 1970 to date. Particular strength in water based food production systems, fish farming, and the like. Hydroponics is excluded.

BIOSIS (Biological Abstracts), 1969 to date. All areas of biological research covered without regard to organism; especially strong in extent and quality of indexing; less strong in coverage of publications on agricultural management practices; very strong in English language publications.

CA SEARCH (Chemical Abstracts), 1967 to date. Coverage of all areas of chemistry is comprehensive. Covers agricultural chemicals, fertilizers, soil and water chemistry, and a wide range of topics in biochemistry of significance to agricultural researchers. Emphasis throughout is on the chemistry of the subject and not necessarily on its effects in living systems. Indexing is extensive and very detailed.

CAB (Commonwealth Agricultural Bureaux), 1972 to date. All areas of agriculture covered; extensive coverage in plant science, entomology, and veterinary science. Very strong in non-U.S. publications, especially from Commonwealth and European sources. Indexing is extensive but highly variable, emanating from numerous information centers, each with its own vocabulary control sources and procedures. Somewhat slower than other databases in adding literature to the database.

CRIS (Current Research Information System), current. Coverage of USDA and cooperative state research project descriptions. Indexing for fully processed records is extensive and records are usually long. Time coverage is limited and bibliographic citations not always present in records.

FOODS ADLIBRA, 1974 to date. Strong in coverage of food industry publications. Emphasis is on new food products and processing methods. Contains food patent citations.

FSTA (Food Science and Technology Abstracts), 1969 to date. Strong coverage in food quality and food composition studies, food processing and related equipment, and food patents. Indexing is extensive. Heavy coverage of non-English sources.

MEDLINE, 1966 to date. Comprehensive coverage of clinical medicine and health care planning and

administration, but has extensive supplemental coverage of basic physiology, biochemistry, and nutrition of significance to agricultural researchers. Emphasis is on humans, but laboratory animals and commonly studied domestic animals also receive extensive treatment. Indexing is detailed and tightly controlled.

DIALOG Information Services and BRS have created special files to help users select databases to be searched. Both DIALOG's DIALINDEX and BRS's CROS database allow searchers to query the online indexes of dozens of files in order to determine how many items would be retrieved from an actual search of selected databases. These file selection aids limit the user to a single search statement and do not allow any display of sample titles. Figure V-1 illustrates a simple search statement executed on both of these files.

DIALINDEX

```
?SELECT FILES 5,10,50

FILE 5: BIOSIS PREVIEWS 81-84/JAN BA7701;RRM2601
FILE 10: AGRICOLA - 1979-83/SEPT & 1979 SUPPLEMENTAL
FILE 50: CAB ABSTRACTS - 72-83/OCT

          FILE  ITEMS  DESCRIPTION
?SELECT SORGHUM(F)SEED? ?(C)VIABILITY
          (5)
                    3  SORGHUM(F)SEED? ?(C)VIABILITY
          (10)
                    4  SORGHUM(F)SEED? ?(C)VIABILITY
          (50)
                   43  SORGHUM(F)SEED? ?(C)VIABILITY
```

Figure V-1a. DIALINDEX search

```
CROS

BRS/CROS/
1 ALL                          2 LIFE SCIENCES
3 PHYSICAL SCIENCES            4 BUSINESS
5 SOCIAL SCIENCES              6 USER OPTION
BRS - SEARCH MODE - ENTER OPTION_: 2

1_:  SORGHUM SAME SEED$1 AND VIABILITY

AAED  0
BBIP  0
BIOB  4
BIOL  6
BOOK  0
CAIN  7
 . . .
SUPE  1
```

Figure V-1b. CROS search

Having determined the potential yield for the simplified strategy on each of the files under consideration, the searcher can then sign on to the most fruitful ones to conduct the search. The actual search may yield more or less than the number indicated in DIALINDEX or CROS since additional search modifications are possible with the full files.

B. Cross-database Searching

The overlap among agricultural files makes it clear that there will be many instances in which a search of more than one database is deemed necessary. When the same topic is going to be searched in multiple files, the process of search strategy formulation can become more complex. The policies and practices followed by each of the selected databases must be considered. A simple example of factors to be considered would be spelling. An index such as Food Science and Technology Abstracts (FSTA), which is published outside the United States, may prefer British spelling and usage, so users must enter search terms following those conventions if they expect to achieve the most satisfactory results. A related issue, but one somewhat more complex, is that of word division. In databases such as BIOSIS and CA SEARCH, certain

complex words are divided in order to make easier the task of searching large concepts. For example, words such as "phytopathology" and "organophosphate" may be searchable in some databases and on some retrieval systems as their component parts--"phyto" and "pathology" or "organo" and "phosphate." The adverse impact on search quality resulting from ignorance or failure to consider these practices can be dramatic. This problem can be especially troublesome in a database such as BIOSIS where words are divided according to established policies if they occur in titles or descriptor lists but not if they occur in abstracts. Thus, users might enter a term such as "organophosphate" and retrieve a reasonable sounding response from the system without realizing that those results represented only those items in which that term had appeared in an abstract. They may very well conclude the search, unaware that they had failed to find the much larger group of references where the term appeared in its divided form in the title or descriptor list.

The simplest solution to problems associated with cross-database searches is for the searcher to treat each part of the search as a separate exercise and to draft and re-enter into the system a completely new profile for each database. In a fundamental sense, of course, that is what must be done regardless of what techniques are actually employed in the search process, but to do each part of a complex search from scratch is an expensive and time consuming process, and generally an unnecessary one, considering the capabilities of most online systems to store and re-execute strategies. Usually, the searcher can enter all or part of a search strategy in one file, have the search terms and the logic stored, and then have that strategy rerun in one or more additional databases.

To be able to store and execute strategies saves time in that the entire stored strategy is fully cued for execution and the tasks can be performed more quickly. Re-executing stored strategies may also increase the overall accuracy of the search in that it reduces the chance of typographical errors by reducing the number of times terms must be keyboarded.

Several approaches can be employed in constructing strategies for searches that will be run against multiple files. Perhaps the simplest method would be to enter all serch keys and terms into a single, large profile and then run the "master profile" against all desired databases. This approach has great merit. The terms for each concept group can be kept together, and they can be keyed in once. Simple word searches, for example, work very well with this technique. It is not, however, appropriate for every application. Figure V-2 illustrates a profile for a search in

BIOSIS and both parts of AGRICOLA on the DIALOG system in which the "master profile" approach would not be very efficient.

Concept 1	Concept 2		
Corn	SH=F830	CC=4505	Mold? ?
Zea Mays	SH=F831	CC=4510	Mould? ?
	SH=F832	CC=4515	Blight?
	SH=F833	CC=4520	Stunt?
	SH=4505	Viral?	Mosaic?
	SH=4510	Virus?	Rot? ?
	SH=4515	Bacteri?	Smut? ?
	SH=4520	Fung?	CN=Phytopathol?

Figure V-2. Profile for search on corn diseases

The codes prefixed by SH= would produce results in the most recent portion of the AGRICOLA database (file 10), while the codes prefixed CC= would function only in the older portion of the database (file 110) for the period 1972 through 1978. The truncated entry "CN=Phytopathol?" would perform the same function in BIOSIS as the AGRICOLA codes. The words would, of course, retrieve results in either file, but they would generally be redundant for all parts of the search except for the part of the search in file 110 covering 1970 and 1971 when the coding scheme used by NAL was not specific to phytopathology. In many instances, in fact, their use would result in many false hits, retrieving papers describing work in which a diseased animal had been fed corn. Thus, running this strategy as a master profile would require the execution of numerous statements which would be at best nonproductive and often counterproductive to the overall quality of the search product.

In addition, an extra measure of care must be given to make sure that no unique feature or search key is used in such a way that the strategy becomes meaningless in other files. Consider, for example, the simple strategy summarized in figure V-3.

LINE	SET	COMMAND
1	1	SELECT WHEAT OR SORGHUM
2	2	LIMIT 1/ENG
3	3	SELECT S2 AND (FUNGUS OR FUNGAL)
4	4	SELECT S3 AND (BREED? OR RESIST?)

Figure V-3. A very limiting search strategy

While such a strategy would work quite well in both parts of the AGRICOLA database, it would net zero citations in databases such as CAB or BIOSIS because a command to LIMIT search results to ENG (English) is meaningless in those files. Had the sequence of operations been altered so that the language limitation was used after the subject terms were combined, then a larger part of the strategy would have been usable on a number of files.

A "faceted" approach to profiling is often called for when execution in multiple databases seems desirable. Figure V-4 illustrates a fairly simple search on hemoglobin in relation to physiology in ruminants. It has been profiled for execution in AGRICOLA, CAB, and BIOSIS.

Concept 1	Concept 2	Concept 3
Hemoglobin	Metabol?	Cattle
Hemo globin	Physiolog?	Calf
Haemoglobin		Calves
Haemo globin		Heifer?
		Steer?
		Bull? ?
		Cow? ?
		Bovine
		Sheep
		Ram? ?
		Lamb? ?
		. . . etc.

Figure V-4. Basic strategy on hemoglobin search

As it is represented in figure V-4, , the strategy would run successfully on any appropriate database because it specifies only words which might appear in any basic index fields. It may not, however, retrieve all the relevant citations for the simple reason that the concepts of metabolism and physiology can be referred to by a wide range of terms. Subject category codes can be particularly helpful in these situations. In AGRICOLA, for instance, one might choose to add codes 2510 (Livestock Biology) and L600 (Animal Physiology and Biochemistry), and in BIOSIS the codes for general metabolism and physiology as well as any of a number of codes for the physiology and biochemistry of specific organ systems (respiratory, endocrine, etc.) would be appropriate. One might also decide that the BIOSIS taxonomic codes relevant to ruminants would be a more efficient method of handling concept 3 in the strategy. The strategy adjusted to include these codes is

illustrated in figure V-5.

Concept 1	Concept 2	Concept 3	
Hemoglobin	Metabol?	Cattle	BC=85705-
Hemo globin	Physiolog?	Calf	BC=85730
Haemoglobin	CC=2510	Calves	(Codes for
Haemo globin	SH=2510	Heifer?	ruminants)
	SH=L600	Steer?	
	CC=13002-	Bull? ?	
	CC=13020	Cow? ?	
	(Metabolism)	Bovine	
	CC=12002-	Sheep	
	CC=12010	Ram? ?	
	(Physiology)	Lamb? ?	
	CC=16504	. . . etc.	
	(Repro. Phys)		

Figure V-5. Modified hemoglobin strategy

When they are typed online, the terms should be entered in such a way that the initial strategy can be executed up to a certain point and then stopped. In this way users can execute the entire word strategy on files such as AGRICOLA and CAB where animals must be named and then modify the strategy with database specific codes, or they can execute only part of the strategy and substitute other codes where they will be more efficient. For example, in BIOSIS, users might choose to execute only the word search for concepts 1 and 2, supplement concept 2 with subject codes, and then use the biosystematic codes for orders of ruminants instead of letting the system execute the lengthy word search for animals. The use of a "faceted" approach to cross database searching clearly requires careful planning by the searcher, but it is absolutely essential if thorough and efficient retrieval is to be achieved.

In some instances the "faceted" approach to profiling can enable the searcher to construct strategies in which entire concepts can be left out of the execution in selected files. For example, a searcher who wants to conduct a search on agricultural or farm credit in both AGRICOLA and one of the business databases may create a profile in which terms such as "agriculture" and "farm" are included for the search of the general business file. They could very likely be left out of a search of AGRICOLA, however, since it would be assumed that the general context of agriculture was present in a search of that file.

C. Special Applications of Saved Searches

The capability to create and re-execute stored strategies opens a number of possibilities for searchers. One can, for example, store strategies for searches that are to be updated periodically, thereby allowing users to create their own current awareness services. Most online vendors provide this as an extra service in which they automatically send a printout each time a database is updated. Files are commonly updated biweekly or monthly; so a user who wants updating as frequently as that might choose the automatic service. By storing strategies and re-executing them locally, however, the user has the capability of getting larger but less frequent updates--quarterly or semiannually, for example.

Another application of saved searches is as conceptual "hedges," or lists of terms for retrieving particular subjects. For example, in a file such as AGRICOLA a thorough search of literature related to cattle requires over a dozen different words, while a search on all areas of the United States might require over 70 terms. By saving permanently a list of terms on a desired topic, a searcher can simply invoke the proper code in order to have that group of terms added to any search profile, thereby avoiding both unnecessary typing and the tedium of looking up the terms each time the conept is used.

Each of the online vendors treats the saving of strategies somewhat differently, so a careful reading of system documentation is warranted. In summary, however,the main points to be aware of are these: (1) The BRS system saves statement numbers as part of the saved strategy; it does not now have the capability to renumber those statements on re-execution of the strategy. If the system encounters search statements already in an active search which would conflict with statement numbers in the strategy it has been instructed to run, it will not execute the saved search. For example, let us say that the following strategy has been stored under the name CROP:

```
1_: CORN WHEAT SORGHUM
2_: 1 WITH (WATER MOISTURE)
3_: 2 SAME (YIELD$1 PRODUCTION)
```

Were the user to execute this strategy at the beginning of a new search, it would be performed without problems. If, however, the user had started a new search and created, say, two statements before trying to execute CROP, the command "..EXEC CROP" would result in the following error message: "E1321 STORED QUERY NUMBER

NOT HIGHER THAN LAST. ENTER NEW COMMAND." This simply means that the BRS system has determined that references to statement numbers 1, 2 and 3 were a part of the saved strategy and that at this point in the current search all or some of those statement numbers had already been used. BRS documentation describes a technique for avoiding this problem, but it is a fairly complex procedure, and generally speaking, one which will not be likely to be used very often. The safest and most successful method to use with BRS saved searches is simply to execute them at the beginning of a new search.

(2) DIALOG saved strategies generally will adjust saved strategy statement on re-execution so that statement numbers will fit in with the numbering of an ongoing search. DIALOG saved searches, therefore, can be invoked more easily in the middle of a search--provided the saved strategy, in its execution, does not exceed either the online storage limit (1,000,000 citations) or the statement number limit (98 statements). Both of these limitations are absolute, and there must be enough room in the user's workspace during the execution of the strategy to hold the results until the final result can be obtained. If either limit is reached, the execution is aborted at that point. There are a number of space saving options open to DIALOG users when they execute saved strategies, all of which are well documented in DIALOG publications

In addition to creating and executing one's own saved strategies, a searcher using the DIALOG system can access strategies stored by other DIALOG users. In order to do this, the searcher must know the serial number of the strategy and the user number under which it is saved. Searchers wanting to access a strategy on cattle, say number 452K, that had been stored under user number 1986 would simply instruct the DIALOG system ".EXECUTE 452K/USER 1986." The system would then find that strategy in the online storage connected to user 1986 and execute it. The user number is not the password, so account security is in no way compromised by communicating it to others. In addition, stored strategies can be erased only by a person signed on with the password linked to a given user number, so there is no danger that another user could accidentally wipe out a saved search.

The staff of the National Agricultural Library have created a large number of saved strategies on topics such as groups of animals, types of plants, soils, and various geographic regions. The current serial numbers and user numbers for several of these searches are listed below. Many of these strategies are very long (well over 50 statements) and they will frequently retrieve many thousands of citations, so users should be careful to use

execution techniques which will allow them to keep their search strategies within the limits of 98 statements and 1 million citations.

NAL Saved Search Numbers (Partial List)

The serial numbers listed here are for saved searches in effect as of January, 1984. They may be changed or deleted without notice.

GEOGRAPHICS

y9g/user 9018	Africa
3yh8/user 1040	Africa, except Sahel
42gj/user 1040	Sahel
qe5/user 9018	Asia and Middle East
3y29/user 1040	Subtropical and Tropical Asia
3hiw/user 9018	China and its provinces
3hiz/user 9018	Malaysia and Indonesia
3j4y/user 9018	Pacific Islands
5fyz/user 1986	Europe, except USSR
5fyc/user 1986	USSR
3y24/user 1040	Subtropical Europe
1iyv/user 1299	South America
4ren/user 1986	Brazil
36t2/user 1299	Central America and the Caribbean
1iy2/user 1986	United States

SOIL CLASSES

3u0y/user 1986	Alfisols and Aridisols
407u/user 1986	Entisols and Histosols
408i/user 1986	Inceptisols
409a/user 1986	Mollisols
409c/user 1986	Oxisols and Spodosols
409g/user 1986	Ultisols and Vertisols

PESTS AND THEIR CONTROL

4mki/user 1986	Ticks
4mm3/user 1986	Mites
3gi5/user 1986	Cotton insects
2sx8/user 1032	Grain insects (part 1)
2tgk/user 1032	Grain insects (part 2)
3hjj/user 9018	Lepidopterous pests
411y/user 1040	Rodents
3r17/user 1040	Insect pests of stored products
3uap/user 1040	Insect genera

3ub5/user 1040	One-word common names of insects
52kc/user 1986	Integrated pest management
2a8v/user 9018	Pesticides in soils
4tiv/user 1986	Insect pests

CROPS, PLANTS, and WEEDS

sa/user 9018	Varieties and cultivars
xd0/user 1987	Varieties and cultivars/ti,de
5ejg/user 9018	Aquatic weeds
2txv/user 9018	Oilseeds and oil plants
5dz5/user 9018	Mycorrhiza
3h4g/user 1042	Plant collecting
5ebo/user 1986	Herbs
578k/user 1986	Forage browse
3tq0/user 1040	Vegetables
3u6g/user 1040	Fruits
4dil/user 1040	Tropical crops
52m3/user 1032	Urban trees
4sls/user 1986	Grasses
4v9o/user 1030	Horticultural therapy
5ib/user 9018	Cropping systems
4yy5/user 1039	Intercropping
53jq/user 1032	Minimum tillage

BIRDS and ANIMALS

4b4t/user 1040	Birds
521b/user 1986	Birds, other than poultry
542d/user 1986	Poultry
542k/user 1986	Cattle
452r/user 1986	Swine
452v/user 1986	Sheep
srx/user 1985	Oestrus and breeding
4vx6/user 1038	Tropical cattle
54f3/user 1038	Implanting embryos
40nx/user 1987	Conception and breeding
55y6/user 1038	Avian infectious bronchitis

NUTRITION, FOODS, and HEALTH

qtn/user 9018	Trace elements and nutrients
sl/user 9018	Essential amino acids
2dsb/user 1986	Vitamins
35xs/user 1040	Fish and seafoods

SOIL RECLAMATION and MANAGEMENT

57je/user 1986	Soil permeability
4dib/user 1040	Arid lands
4mlx/user 1040	Aerial seeding
585k/user 9018	History of soil conservation
5fbj/user 9018	Reclaiming disturbed lands
1jq/user 1299	Range management
ytg/user 1985	Precipitation and runoff
onb/user 9018	Small farms/part-time farming
4120/user 1032	Aquaculture
4ult/user 1039	Heavy metals

MISCELLANEOUS

5hu5/user 9018	Discrimination
2v2u/user 1031	MBO
51a9/user 1986	Bibliographies and review articles
4mf3/user 1986	Long-range planning
2udv/user 1986	Urban development
4113/user 1040	Appropriate technology
411w/user 1040	Postharvest food losses
5ç6v/user 9018	Alcohol fuels
1eqy/user 9018	Careers in agriculture
5fzs/user 1986	Chromosomes and karyology

APPENDIX A

CATEGORY CODE SUMMARY

OLD CATEGORY CODES. The two-digit category codes assigned to documents entered in AGRICOLA during 1970-71 are included in the OC= field in DIALOG's file 110 and in the .CC. field in the BRS system.

05 Agriculture (general)
10 Agricultural economics and rural sociology
15 Agricultural products (economics and technology)
20 Animal sciences
25 Chemistry
30 Engineering
35 Entomology
40 Food, human nutrition, and home economics
45 Forestry
50 Life sciences (general)
55 Natural resources (general)
60 Pesticides (general)
70 Plant sciences
75 Social Science (general)
80 Soils and fertilizers
85 Water resources
90 Reference materials

1972-79 CATEGORY CODES. The four-digit category codes assigned to documents entered in AGRICOLA during 1972-79 are included in the CC= field in DIALOG's file 110 and in the SH= field in file 10 (1979 only). In the BRS system the codes appear in the .CC. field.

General Agriculture and Rural Sociology
0505 General Agriculture and Rural Sociology

Agricultural Economics (see also AGE categories)
1005 General Agricultural Economics and Land Economics
1010 Agricultural Administration and Management
1015 Agricultural Production Costs and Returns
1020 Agricultural Production Distribution (Farm Products)
1025 Statistical Data and Methodology
1030 Outlook, Policies, Programs and Legislation

Consumer Protection and Nutrition (see also FNC categories)
1505 Consumer Protection
1510 Human Nutrition
1515 Home Economics

Agricultural Products
2005 Agricultural Products, General
2010 Dairy Products
2015 Livestock Products
2020 Poultry Products
2025 Field Crop Products
2030 Horticultural Products
2035 Feed Products

Animal Science

- 2505 General and Miscellaneous Animal Husbandry
- 2510 Livestock Biology
- 2515 Livestock Feeding
- 2520 Livestock Breeding

Veterinary Medicine

- 3005 Veterinary Medicine
- 3010 Infectious and Parasitic Diseases
- 3015 Non-infectious Diseases
- 3020 Miscellaneous Diseases and Injuries

Forestry

- 3505 Forestry, General
- 3510 Forest Economics and Management
- 3515 Silviculture
- 3520 Forest Industries

Plant Science

- 4005 General Plant Science
- 4010 Plant Taxonomy and Geography
- 4015 Plant Ecology
- 4020 Plant Morphology, Anatomy and Cytology
- 4025 Plant Genetics and Breeding
- 4030 Plant Physiology and Biochemistry, General
- 4035 Physiology and Biochemistry of Field Crops
- 4040 Physiology and Biochemistry of Horticultural Crops
- 4045 Physiology and Biochemistry of Forest Trees
- 4050 Field Crops, Culture
- 4055 Horticultural Crops, Culture
- 4060 Miscellaneous Economic Plants, Culture

Plant Diseases, Insect Pests and Control

- 4505 Plant Fungus Diseases and Control
- 4510 Plant Bacterial Diseases and Control
- 4515 Plant Virus Diseases and Control
- 4520 Miscellaneous Plant Diseases, Injuries and Control
- 4525 Weeds and Weed Control
- 4530 Insect Pests and Control, General and Miscellaneous Plants
- 4535 Insect Pests and Control, Field Crops
- 4540 Insect Pests and Control, Horticultural Crops
- 4545 Insect Pests and Control, Forest Trees and Wood Products
- 4550 Insect Pests and Control, Products
- 4555 Insect Pests and Control, Animals and Man
- 4560 Pesticides, General

Entomology

- 5005 General Entomology
- 5010 Taxonomic Entomology
- 5015 Apiculture and Sericulture

Agricultural Engineering
- 5505 Agricultural Engineering and Farm Structures
- 5510 Farm Equipment

Soil and Water Resource Management
- 6005 Soil Science
- 6010 Soil Improvement Materials
- 6015 Soil Resources and Management
- 6020 Water Resources and Management

General Natural Resources and Environmental Pollution
- 6505 General Natural Resources and Environmental Pollution

Auxiliary Categories
- 7005 Life Sciences
- 7505 Physical Sciences and Mathematics
- 8005 Chemistry
- 8505 Technology
- 9005 Economics and Administration
- 9505 Social Sciences and Humanities
- 9705 Information Science

AGECON CATEGORY CODES. The four-digit category codes listed below were assigned to the items entered into the AGE and AGC subfiles of AGRICOLA during the period 1970-76. Since that time these codes have ceased to be used and the NAL category codes for the appropriate subjects have been assigned.

- 1010 Agricultural Marketing
- 1020 Agricultural Policies and Programs
- 1030 Agricultural Products Demand, Supply, and Processing
- 1040 Food and Consumer Economics
- 1050 Foreign and International Development
- 1060 Production Economics and Farm Management
- 1070 Regional and Human Development
- 1080 Resource Economics
- 1090 General (not elsewhere classified)

FNIC CATEGORY CODES. The four-digit category codes listed below were used by staff of the Food & Nutrition Information Center during 1970-79. Since 1980 the current AGRIS-compatible codes have been adopted.

1505 Consumer Education
1510 Nutritional Science and Nutrition Education
1520 History
1525 Food Standards and Legislation
1530 Management and Administration
1535 Education and Training
1540 Menu Planning
1545 Food Preparation and Production
1550 Equipment
1555 Sanitation and Safety
1560 Food Technology
1565 Programs, General
1570 Recipes
1575 Reference Materials
1580 Purchasing, Receiving and Storage

Additional FNIC codes used during 1979:

1511 Nutrition and Health Education
1512 Physiology of Human Nutrition
1513 Diet and Diet-related Diseases
1514 Food Composition
1516 Food Service Management

AGRIS-COMPATIBLE CATEGORY CODES. The four-character alphanumeric category codes listed below have been assigned to items in AGRICOLA since 1980.

Agriculture, General
A000 Agriculture, General
A500 Research

Geography, Climate and History
B000 Geography, Climate and History, General
B100 Geography
B200 Meteorology and Climatology
B500 History

Education, Extension and Advisory Work
C000 Education, Extension & Advisory Work, General
C100 Education and Training
C200 Extension and Advisory Work
C210 U.S. Extension Services

Administration and Legislation
D000 Administration and Legislation, General
D100 Administration
D500 Legislation

Economics, Development and Rural Sociology

- E000 Economics, Development and Rural Sociology, General
- E100 Economics, General
- E110 Land Economics
- E130 Economics of Agricultural Production (since 1/82)
- E200 Farm Organization and Management
- E300 Development aid, Aims, Policies, Programs
- E310 U.S. Food and Nutrition Programs
- E400 Cooperatives
- E500 Rural Sociology
- E550 Rural Development
- E560 Rural Community Services (since 1/81)
- E700 Distribution and Marketing
- E710 Grading, Standards, Labeling
- E720 Consumer Economics

Plant Science

- F000 Plant Science, General
- F100 Plant Production, General
- F110 Plant Production, Horticultural Crops
- F120 Plant Production, Field Crops
- F130 Plant Production, Pastures and Range
- F140 Plant Production, Miscellaneous crops
- F200 Plant Breeding
- F300 Plant Ecology
- F400 Plant Structure and Cytology
- F500 Plant Nutrition
- F600 Plant Physiology and Biochemistry
- F700 Plant Taxonomy and Geography
- F800 Plant Protection
- F820 Pests of Plants, General and Miscellaneious
- F821 Pests of Plants, Insects
- F822 Pests of Plants, Nematodes
- F830 Plant Diseases, General
- F831 Plant Diseases, Fungal
- F832 Plant Diseases, Bacterial
- F833 Plant Diseases, Viral
- F840 Plant Diseases, Physiological
- F841 Miscellaneious Plant Disorders
- F850 Protection of Stored Plant Products, General & Miscellaneous
- F851 Protection of Stored Plant Products, Insects
- F900 Weeds

Pesticides, General

- H000 Pesticides, General

Soil Science

- J000 Soil Science, General
- J100 Soil Biology
- J200 Soil Chemistry and Physics

Soil Science (cont'd)

- J300 Soil Classification and Genesis
- J400 Soil Surveys and Mapping
- J500 Soil Fertility and Fertilizers
- J600 Soil Resources and Management
- J700 Soil Cultivation
- J800 Soil Erosion and Reclamation

Forestry

- K000 Forestry, General
- K001 Forestry Related (since 1/81)
- K200 Forestry Production, General
- K110 Forestry Production, Natural Regeneration
- K120 Forestry Production, Artificial Regeneration
- K130 Forestry Production, Engineering and Harvesting
- K200 Forest Management
- K250 Forest Mensuration and Description
- K500 Forest Products, General
- K510 Forest Products, Wood
- K520 Forest Products, Composite and Reconstituted Wood
- K530 Forest Products, Pulp and Paper
- K540 Forest Products, Chemicals
- K550 Forest Products, Miscellaneous
- K800 Forest Injuries and Protection
- K810 Fire Management

Animal Science

- L000 Animal Science, General
- L001 Entomology Related (since 1/81)
- L002 Apiculture Related (since 1/81)
- L003 Sericulture Related (since 1/81)
- L100 Animal Production
- L200 Animal Genetics
- L210 Animal Reproduction
- L300 Animal Ecology
- L400 Animal Structure and Cytology
- L500 Animal Nutrition
- L600 Animal Physiology and Biochemistry
- L700 Animal Taxonomy and Geography
- L800 Veterinary Science and Hygiene
- L810 Veterinary Pharmacology and Immune Therapeutic Agents (since 1/83)
- L820 Pests of Animals, General and Miscellaneous
- L821 Pests of Animals, Insects
- L822 Pests of Animals, Helminths
- L823 Pests of Animals, Protozoa (since 1/81)
- L830 Animal Diseases, General
- L831 Animal Diseases, Fungal
- L832 Animal Diseases, Bacterial
- L833 Animal Diseases, Viral
- L840 Animal Diseases, Physiological

Animal Science (cont'd.)

L841 Miscellaneous Animal Disorders and Trauma
L850 Protection of Stored Animal Products, General and Miscellaneous
L851 Protection of Stored Animal Products, Insects

Aquatic Sciences and Fisheries

M000 Aquatic Sciences and Fisheries, General
M001 Aquaculture Related (since 1/81)
M100 Aquaculture and Fisheries, General
M110 Fisheries Production
M120 Animal Aquaculture
M130 Plant Aquaculture
M200 Fisheries and Aquaculture Management, General
M210 Fisheries Management
M220 Aquaculture Managment
M300 Aquatic Biology and Ecology, General
M310 Aquatic Biology and Ecology, Animals
M320 Aquatic Biology and Ecology, Plants
M400 Oceanography
M500 Limnology

Agricultural Engineering

N000 Agricultural Engineering, General
N100 Structures and Structural Equipment
N200 Farm Equipment

Natural Resources

P000 Natural Resources, General
P100 Energy Resources, General
P110 Conseravation and Use of Energy
P120 Biomass Energy Sources
P130 Alternative Sources of Energy
P140 Consequences of Energy Production and Use
P200 Water Resources and Management
P210 Drainage and Irrigation
P300 Land Resources

Food Science and Food Products

Q000 Food Science and Food Products, General
Q001 Food Science, Dairy Products
Q002 Food Science, Livestock Products
Q003 Food Science, Poultry Products
Q004 Food Science, Field Crop Products
Q005 Food Science, Horticultural Crop Products
Q006 Food Science, Fish and Aquatic Products (since 1/82)
Q100 Food Processing, General
Q101 Food Processing, Dairy Products
Q102 Food Processing, Livestock Products
Q103 Food Processing, Poultry Products
Q104 Food Processing, Field Crop Products

Food Science and Food Products (cont'd.)

Q105 Food Processing, Horticultural Crop Products
Q106 Food Processing, Fish and Aquatic Products (since 1/82)
Q110 Food Storage
Q111 Food Storage, Dairy Products
Q112 Food Storage, Livestock Products
Q113 Food Storage, Poultry Products
Q114 Food Storage, Field Crop Products
Q115 Food Storage, Horticultural Crop Products
Q116 Food Storage, Fish and Aquatic Products (since 1/82)
Q120 Microbiology of Food Processing
Q121 Microbiology of Food Processing, Dairy Products
Q122 Microbiology of Food Processing, Livestock Products
Q123 Microbiology of Food Processing, Poultry Products
Q124 Microbiology of Food Processing, Field Crop Products
Q125 Microbiology of Food Processing, Horticultural Crop Products
Q126 Microbiology of Food Processing, Fish and Aquatic Products (since 1/82)
Q200 Food Contamination & Toxicology
Q201 Food Contamination & Toxicology, Dairy Products
Q202 Food Contamination & Toxicology, Livestock Products
Q203 Food Contamination & Toxicology, Poultry Products
Q204 Food Contamination & Toxicology, Field Crop Products
Q205 Food Contamination & Toxicology, Horticultural Crop Products
Q206 Food Contamination & Toxicology, Fish and Aquatic Products (since 1/82)
Q300 Food Packaging
Q301 Food Packaging, Dairy Products
Q302 Food Packaging, Livestock Products
Q303 Food Packaging, Poultry Products
Q304 Food Packaging, Field Crop Products
Q305 Food Packaging, Horticultural Crop Products
Q306 Food Packaging, Fish and Aquatic Products (since 1/82)
Q400 Food Additives
Q401 Food Additives, Dairy Products
Q402 Food Additives, Livestock Products
Q403 Food Additives, Poultry Products
Q404 Food Additives, Field Crop Products
Q405 Food Additives, Horticultural Crop Products
Q406 Food Additives, Fish and Aquatic Products (since 1/82)
Q500 Food Composition
Q501 Food Composition, Dairy Products
Q502 Food Composition, Livestock Products
Q503 Food Composition, Poultry Products
Q504 Food Composition, Field Crop Products
Q505 Food Composition, Horticultural Crop Products
Q506 Food Composition, Fish and Aquatic Products (since 1/82)

Feed Products

- R000 Feed Products, General
- R100 Feed Processing and Storage
- R110 Microbiology of Feed Processing
- R200 Feed Contamination and Toxicology
- R300 Feed Composition

Agricultural Products, Nonfood & Nonfeed

- S000 Agricultural Products, Nonfood & Nonfeed, General
- S100 Agricultural Products, Nonfood & Nonfeed, Animal
- S200 Agricultural Products, Nonfood & Nonfeed, Plant

Human Nutrition

- T000 Human Nutrition, General
- T100 Nutrition Education
- T120 Food Service
- T200 Physiology of Nutrition
- T300 Diet and Diseases

Home Economics

- U000 Home Economics, General

Human Parasitology (since 1/83)

- V000 Human Parasitology, General
- V820 Parasites of Humans, General and Miscellaneous
- V821 Parasites of Humans, Insects and Other Arthropods
- V822 Parasites of Humans, Helminths
- V823 Parasites of Humans, Protozoa

Pollution

- W000 Pollution, General

Auxiliary Disciplines

- X000 Auxiliary Disciplines, General
- X100 Mathematics and Statistics
- X200 Documentation
- X300 Life Sciences
- X380 Human Medicine (since 1/83)
- X400 Physical Sciences
- X500 Chemistry
- X600 Technology
- X700 Economics and Administration
- X800 Social Sciences and Humanities

APPENDIX B

DIALOG/BRS Basic Function Summary

FUNCTION	DIALOG	EXAMPLE	BRS	EXAMPLE
Starting a search	Connected to default file at logon or can use BEGIN	BEGIN ! !3 !10 B110	System asks for name of database after sign-on	
Changing files	.FILE___ (file #) BEGIN___ (file #)	.FILE10 BEGIN110 !60	..CHANGE/___ (file name) ..C/___ (file name)	..CHANGE/CAIN ..C/BIOL
Entering search terms	SELECT--- (term or reference numbers) Enter terms singly or with logical connectors	SELECT PEA S CC=4505 S LIVE(W)OAK S E6-E8,E10 SS S1 AND ROT	Enter terms singly or with logical connectors	ALFALFA LIVE ADJ OAK JONES ADJ B ADJ J MOISTURE AND LOSS LIVE WITH WEIGHT.TI.
Viewing list of index terms	EXPAND--- (desired term)	EXPAND ROSE E AU=JONES, "NO=HD9050	ROOT--- (desired term)	ROOT ECONOMICS ROOT HD9050 ROOT JONES
Coordinate search terms	COMBINE--- (set #'s joined by logical connectors) or use SUPERSELECT	COMBINE 1*2. C 3 NOT 4 C1-8/OR SS S1 AND PEA S LIVE * OAK	Use logical connectors when entering search or use to join statement #'s	PIG AND 3010.CC. 1 WITH (OAK OR ELM) 5 NOT (3 OR 4)
Reviewing search history	DISPLAY SETS	DS 1-3 DISPLAY SETS @7	..DISPLAY	..DISPLAY ..DISPLAY 1,3 ..D ALL
Viewing search results online	TYPE_/_/_ (set#/format/ item # or number range)	TYPE6/2/1-9 T3/6/1,3,5,7 '6/5/1	..PRINT--- (set#,elements & document numbers)	..PRINT 3 TI/DOC=1 ..P 5 BIBL/DOC=ALL ..P 5 TI,SO/DOC=2,5
Ordering offline prints	PRINT_/_/_ same as TYPE command	PRINT6/3/1-25 &6/5/1-5,10	..PRINTOFF (set#,elements, documents, & ID tag)	..PRINTOFF 2 ALL/DOC=ALL/ID=JONES ..PO 2 ALL/DOC=ALL/ID=JONES

APPENDIX C

DIALOG/BRS Retrieval Code Summary

DIALOG (10)	DIALOG (110)	BRS
Basic Index (no qualifier) /AB,/DE,/MT,/SH,/TI	Basic Index (no qualifier) /AB,/CS,/DE,/TI	Basic Index (no qualifier) AB,AU,CC,CN,IN,TI,TR
Field Qualifiers:	Field Qualifiers:	Field Qualifiers:
/AB Abstract, free text	/AB Abstract, free text	.AB. Abstract, free text
AN= Accession number	NO= Identification number	AN* Accession number
AU= Personal Author	AU= Personal Author	.AU. Authors, Personal & Corporate, free text
BN= Intl. Standard Book #	-	-
CA= Call number	NO= Call number	.CN. Call number (no punctuation)
CL= Conference location, free text	-	-
CN= Contract number	-	-
CO= CODEN	-	-
CT= Conference title, free text	-	-
CY= Conference year	-	-
CS= Corporate source, free text	/CS Corporate source, free text	.IN. Institutional affiliation, free text
/DE Descriptor, free text	/DE Descriptor, free text	.DE. Descriptor, free text
DT= Document type: series, monograph, article	DT= Document type: series, monograph, article	PT+ Publication type: article (J), monograph (M), series (S)
ED= Edition, free text	-	-
GL= Geographic location, free text	/DE Geographics in descriptor free text	.DE. Geographics in descriptor free text
GP= GPO number	-	-
GS= Governmental source	-	-
HL= Holding library	-	-
JN= Journal name or abbreviation	JN= Journal name or abbreviation	Print only
LA= Language (LIMIT /ENG for English)	LA= Language (LIMIT /ENG for English)	LG+ Language
LC= Library of Congress card number	-	-
/MT Notes, free text	Print only	MT* Notes
PU= Publisher	Print only	Print only
PY= Publication date	SY=,SM=,SD= Publication Year, Month, Date	YR+ Publication date
SE= Series statement, free text	Print only	-
SF= Subfile	LO=, SC= Location or Source Codes	SH+ Source name
SH= Section heading codes	OC=,CC= Old code, Category codes	.CC. Category codes
/SH Section heading titles, free text	-	-
SN= Intl. standard serial #	-	-
SP= Sponsoring agency	Print only	Print only
/TI Title, free text	/TI Title, free text	.TI. Title, free text
UD= Update	UD= Update	Latest update searchable in the CAIX database

+Limit only
*Display only (separately tagged in record)

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